VOL. XLIV. No. 12 DECEMBER 1959

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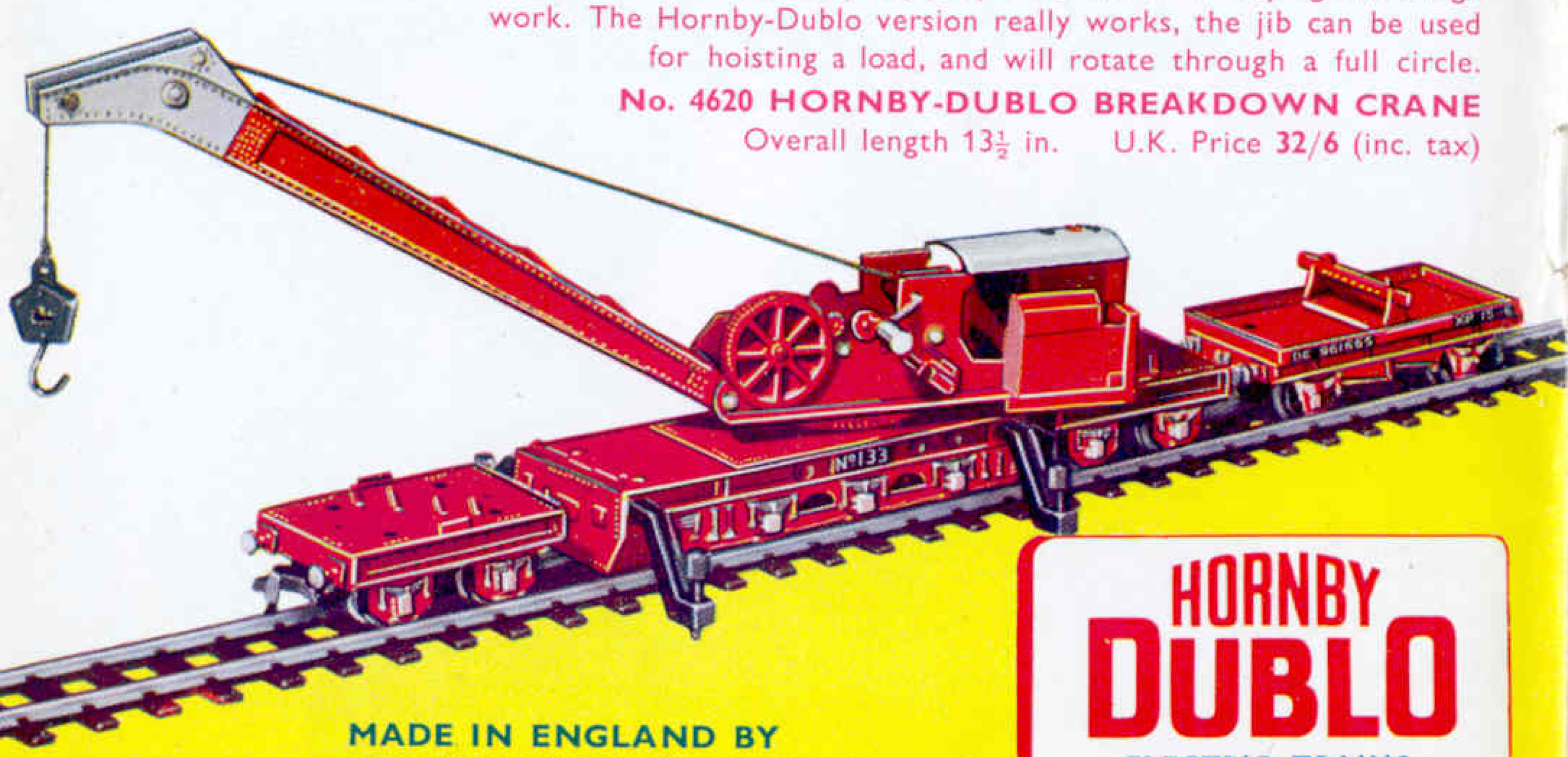
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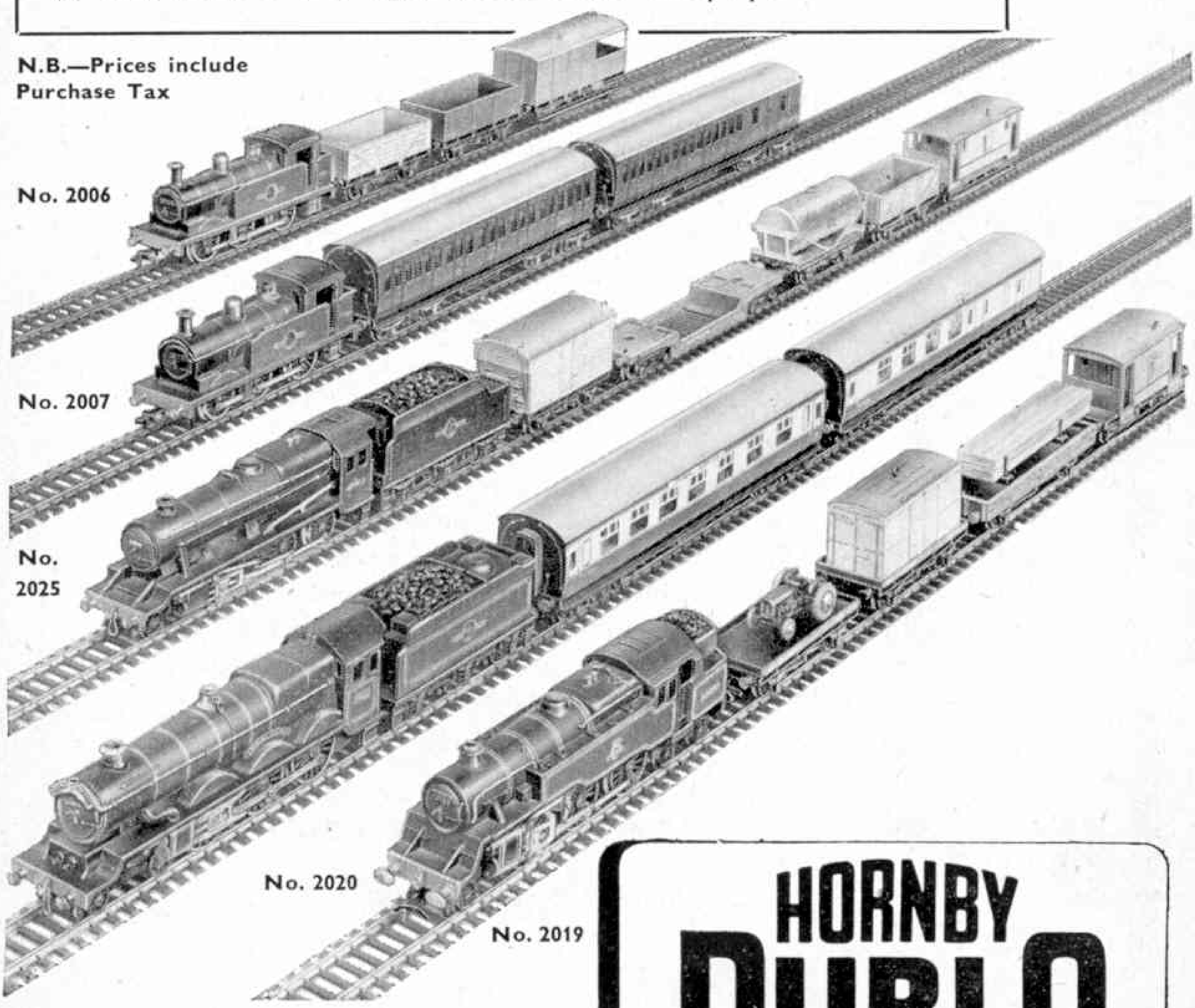
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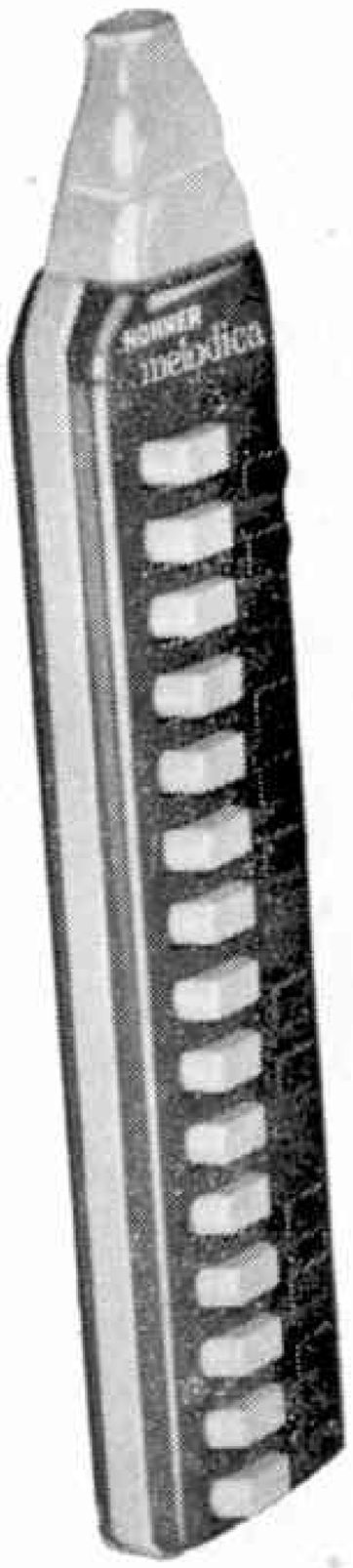
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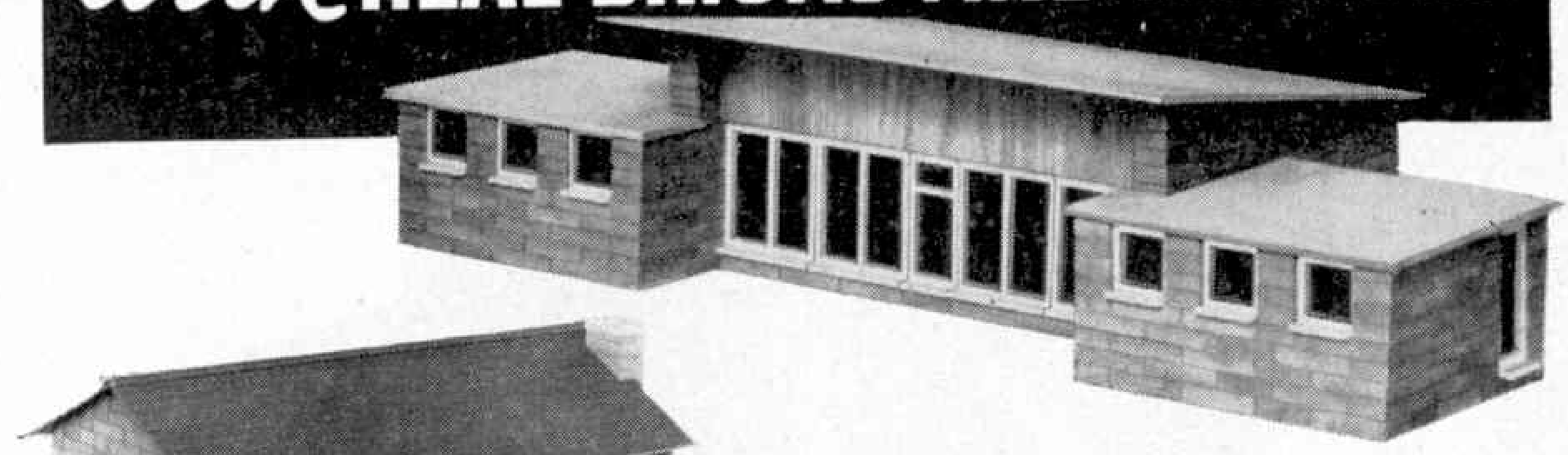
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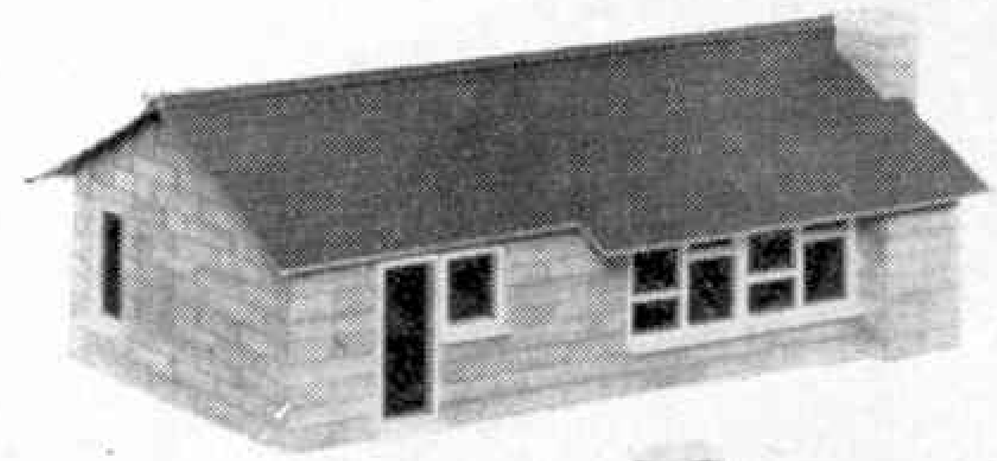
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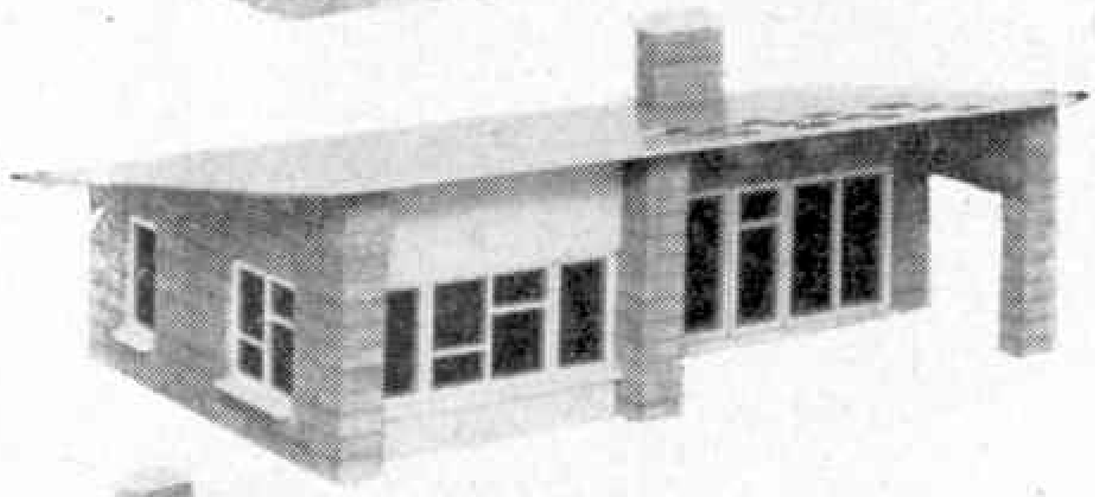
HOHNER (DEPT. M1)

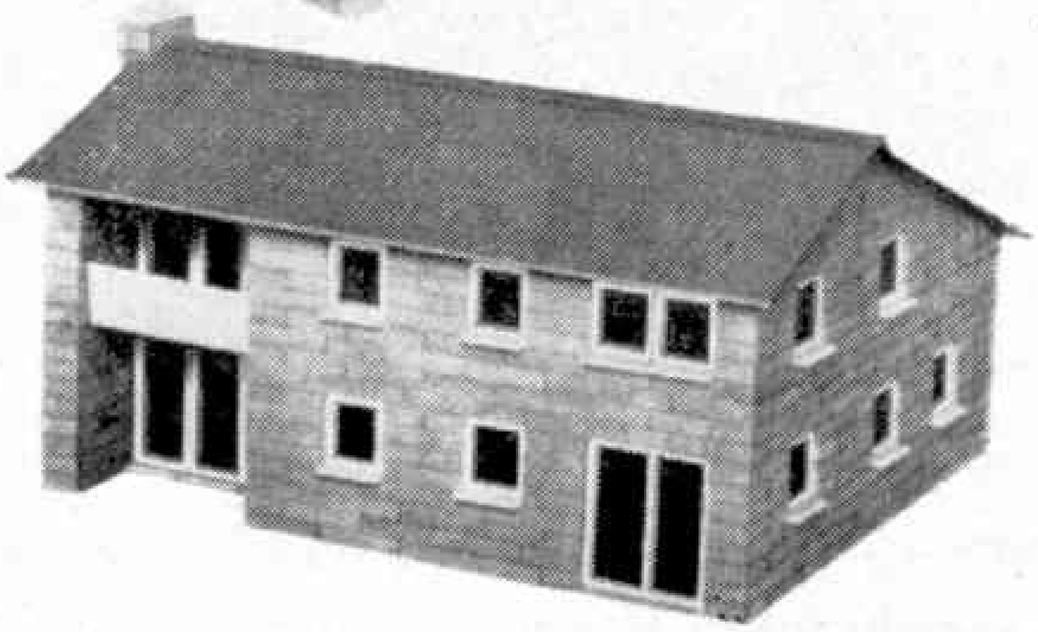
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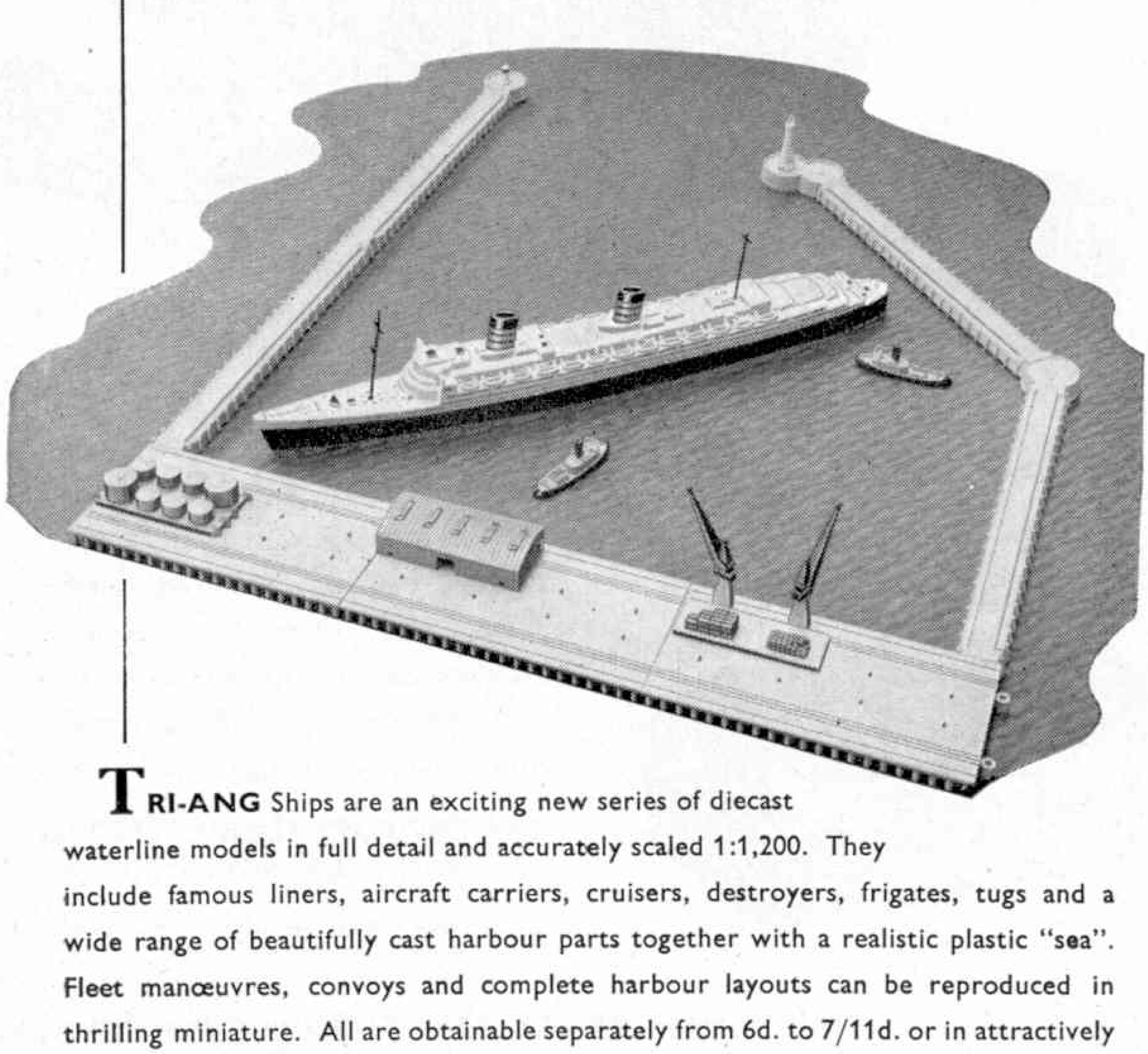
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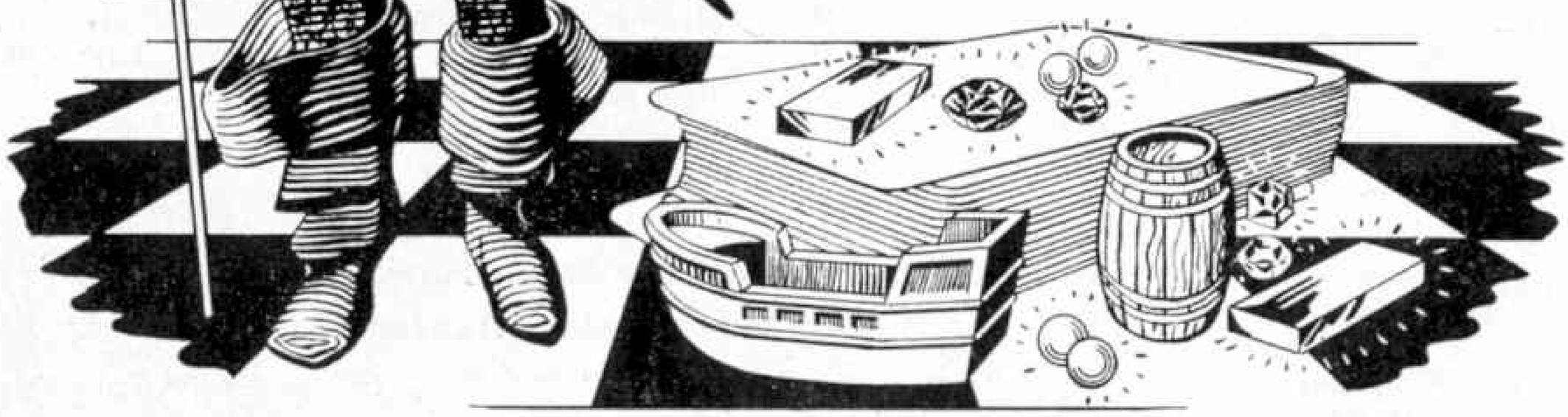
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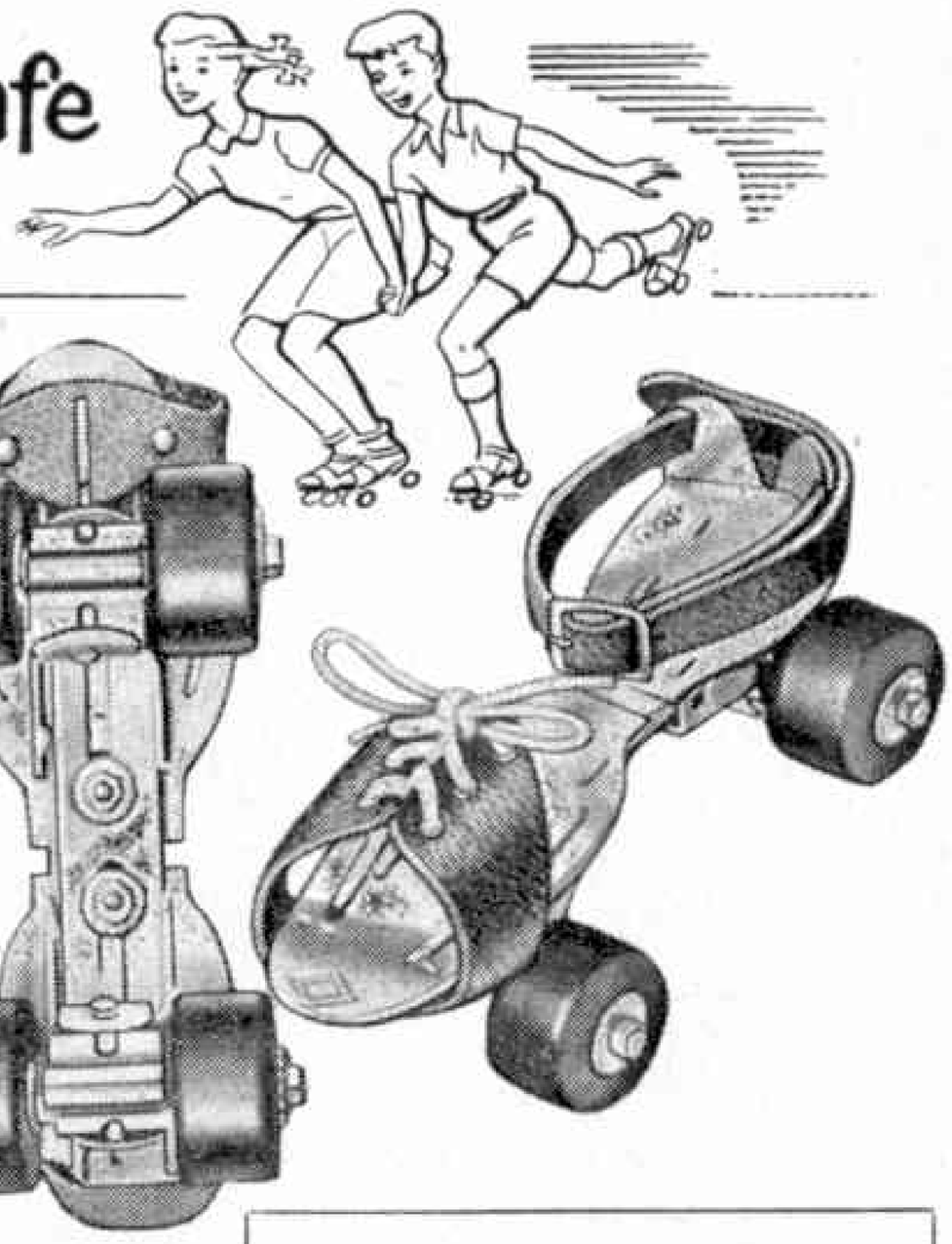
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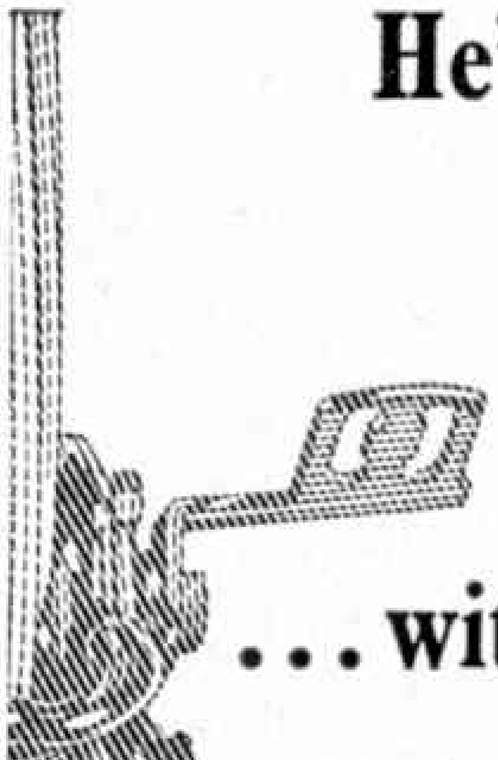
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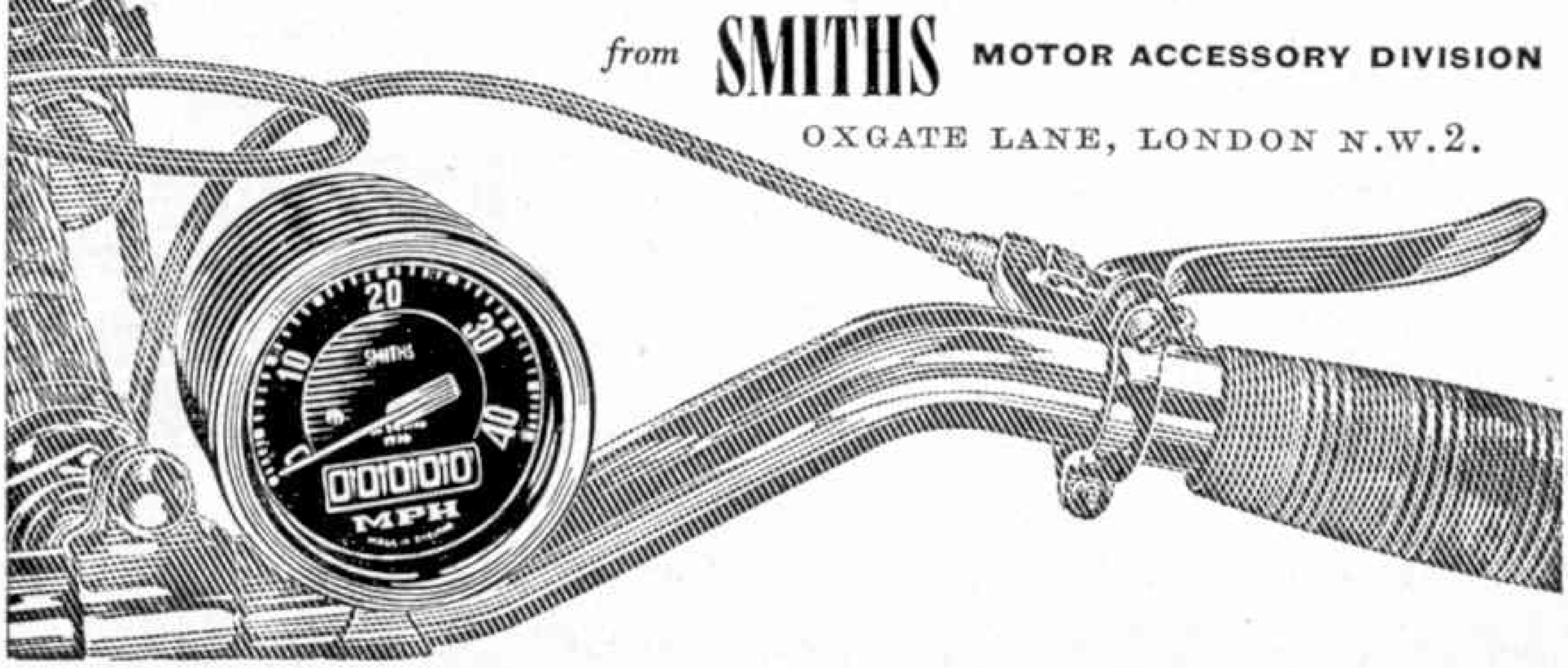
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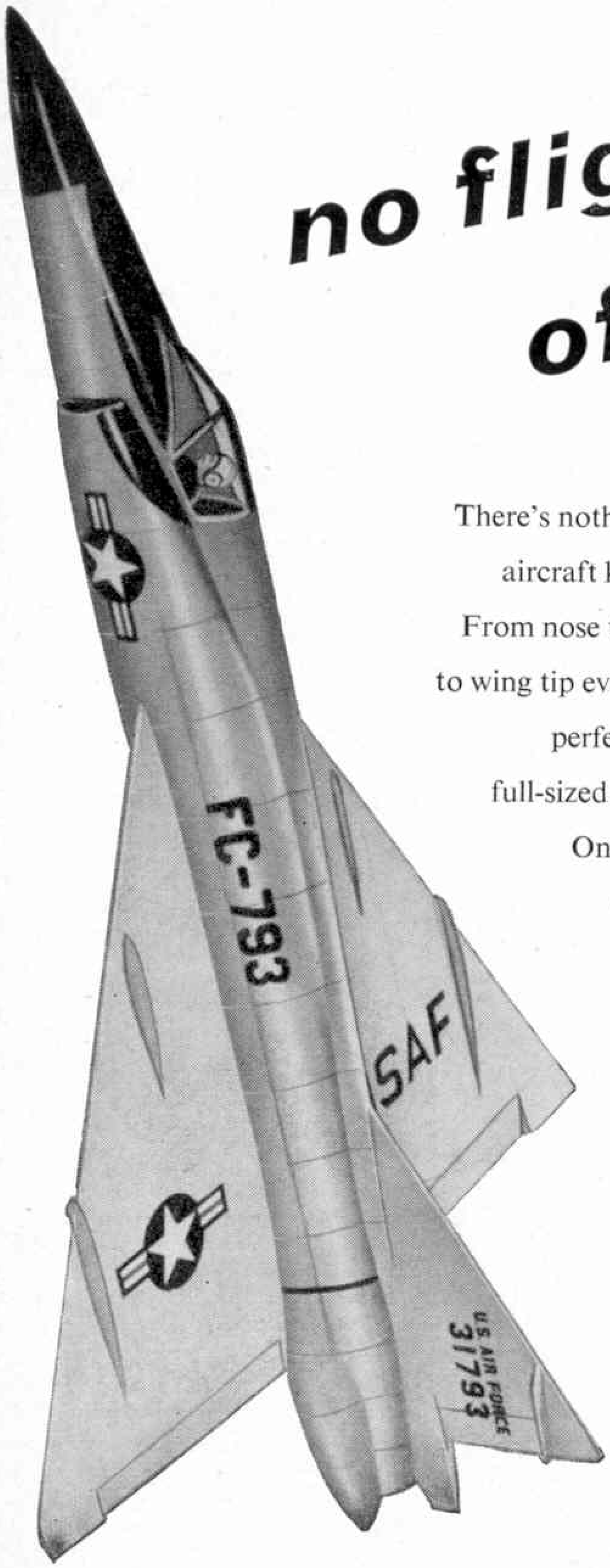
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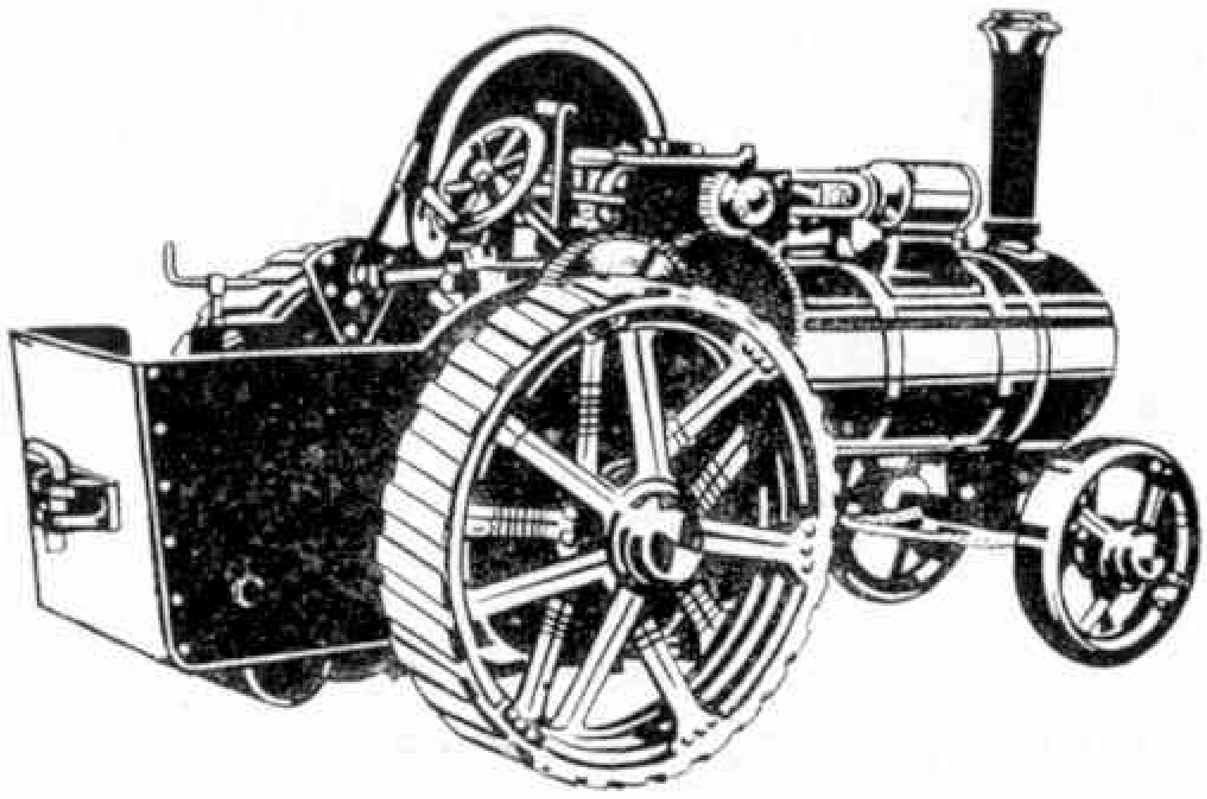
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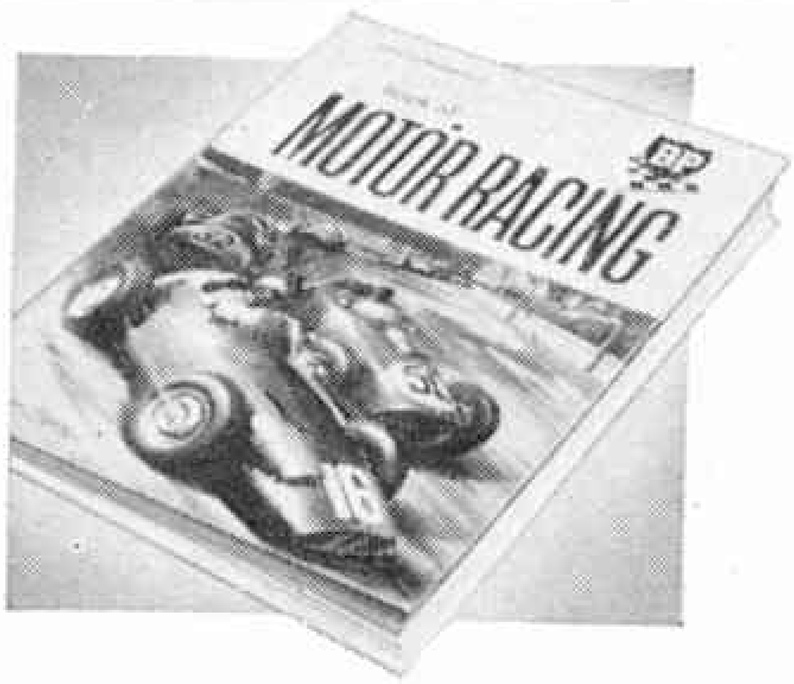
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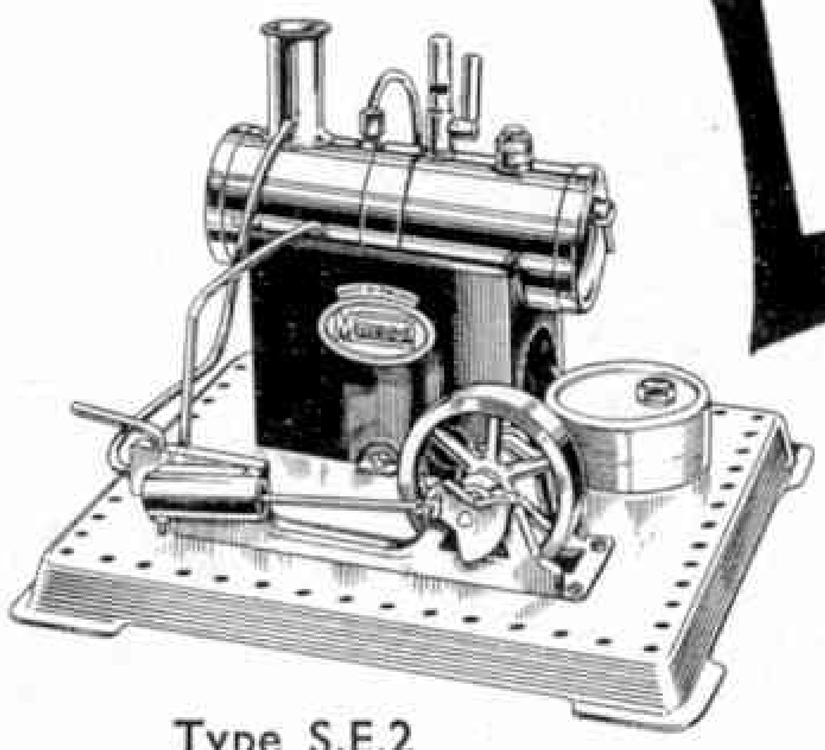
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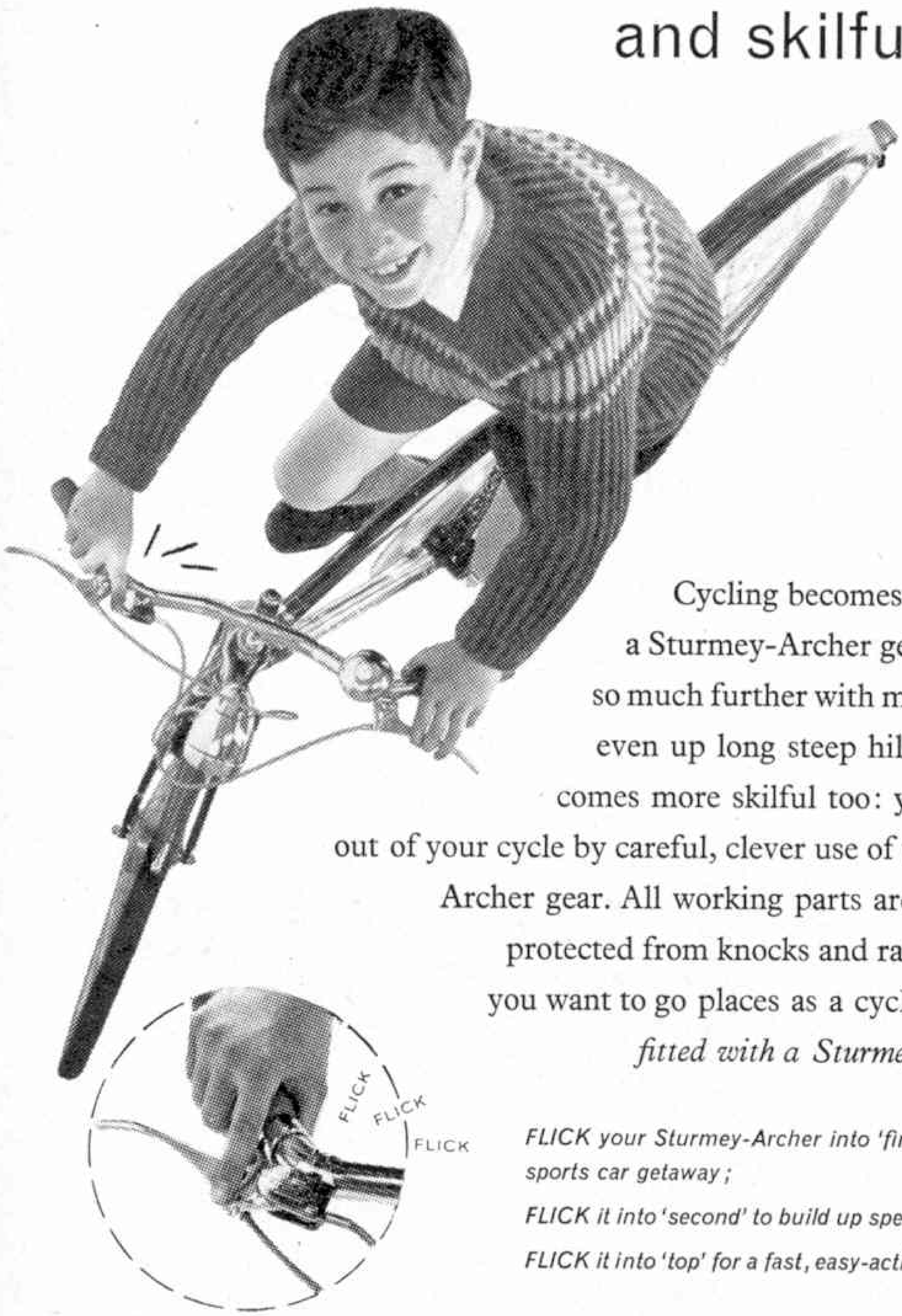
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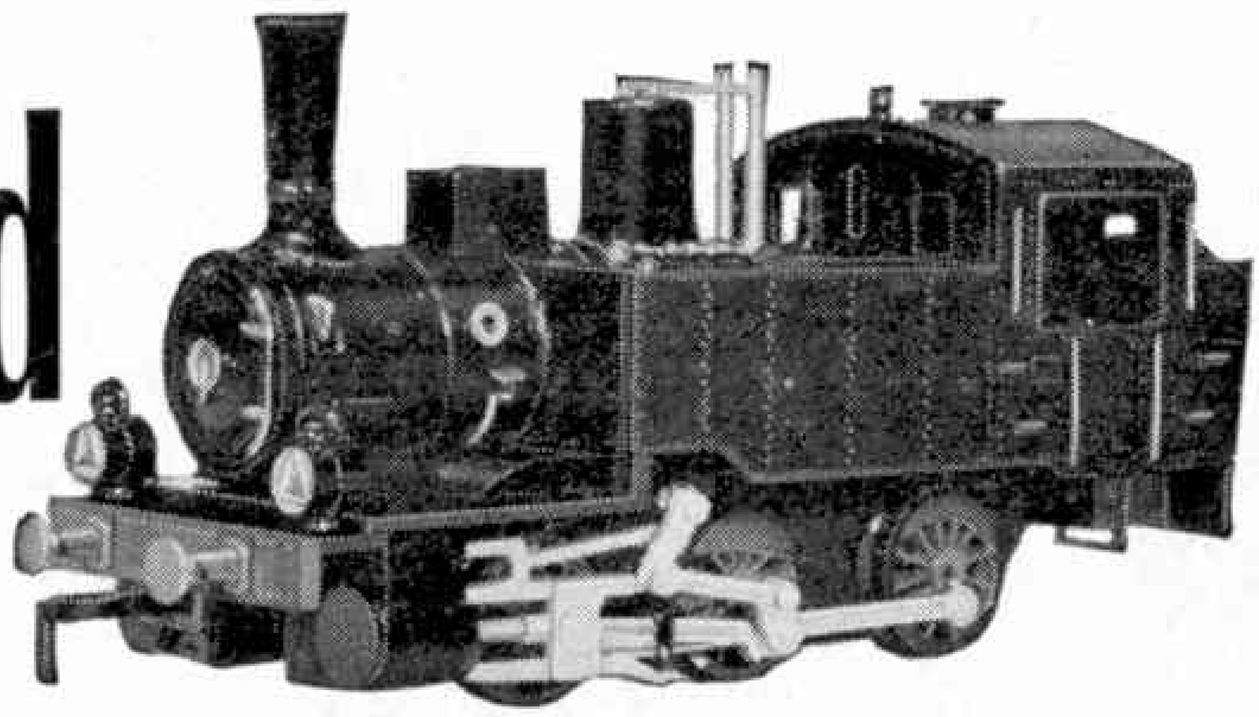
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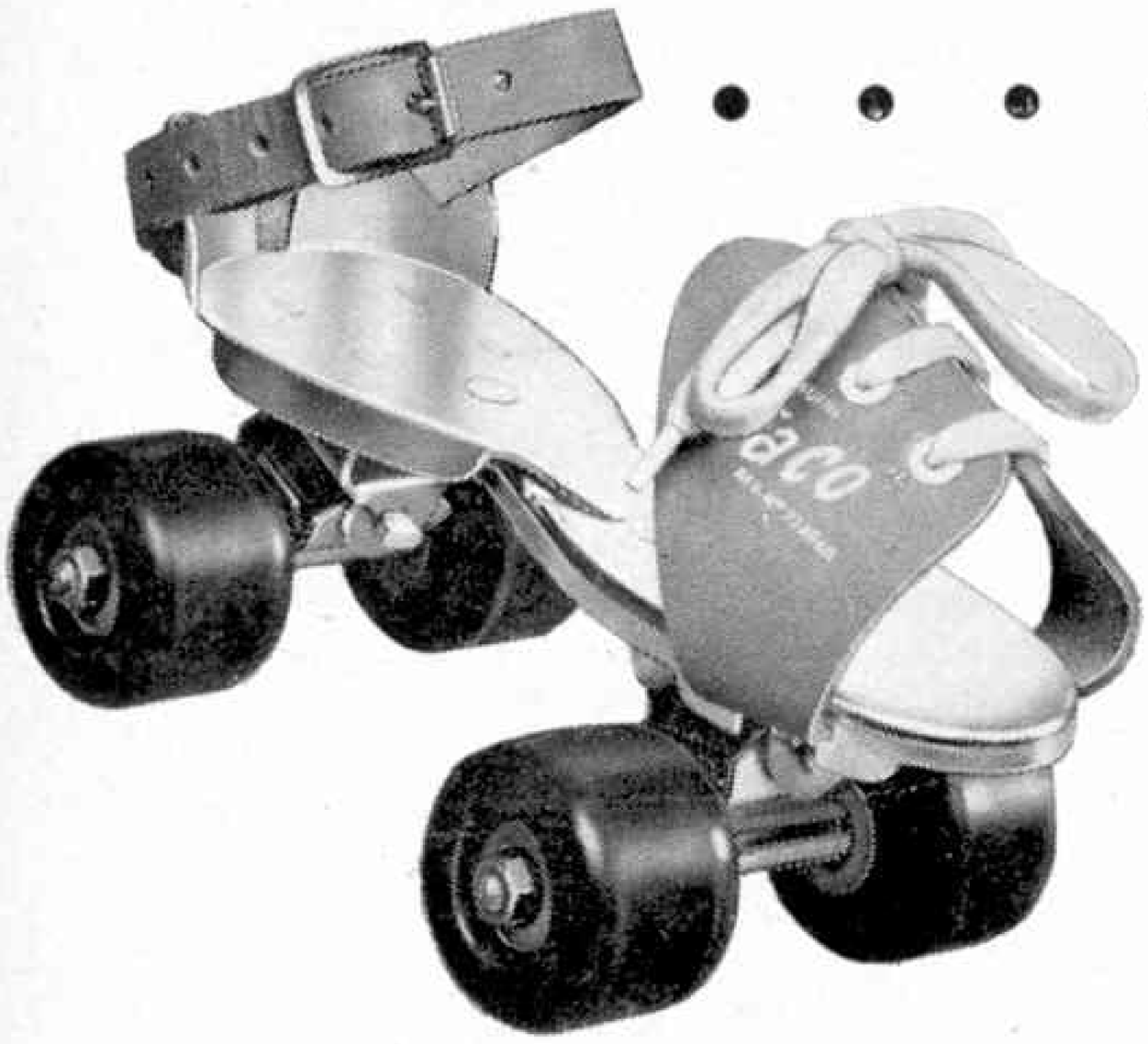
It's a great day for model enthusiasts when a new 'Kitmaster' appears. Here's this month's—an authentic scale model of the Italian Tank locomotive, used for shunting duties by the Italian State Railways. Like all 'Kitmaster' models it's for use on OO and HO gauge tracks.

Hurry to your nearest model or toy shop.

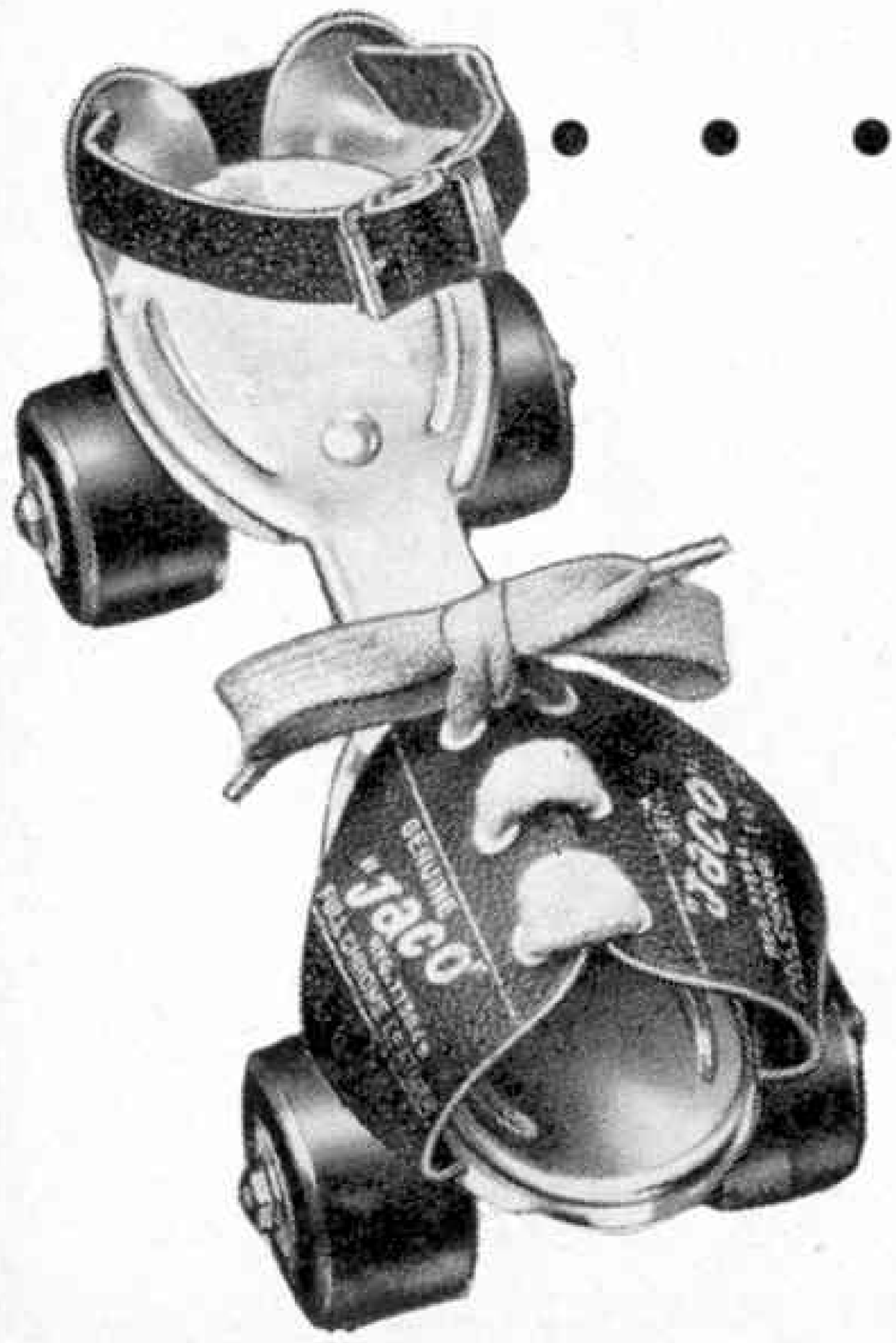
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roll round the world



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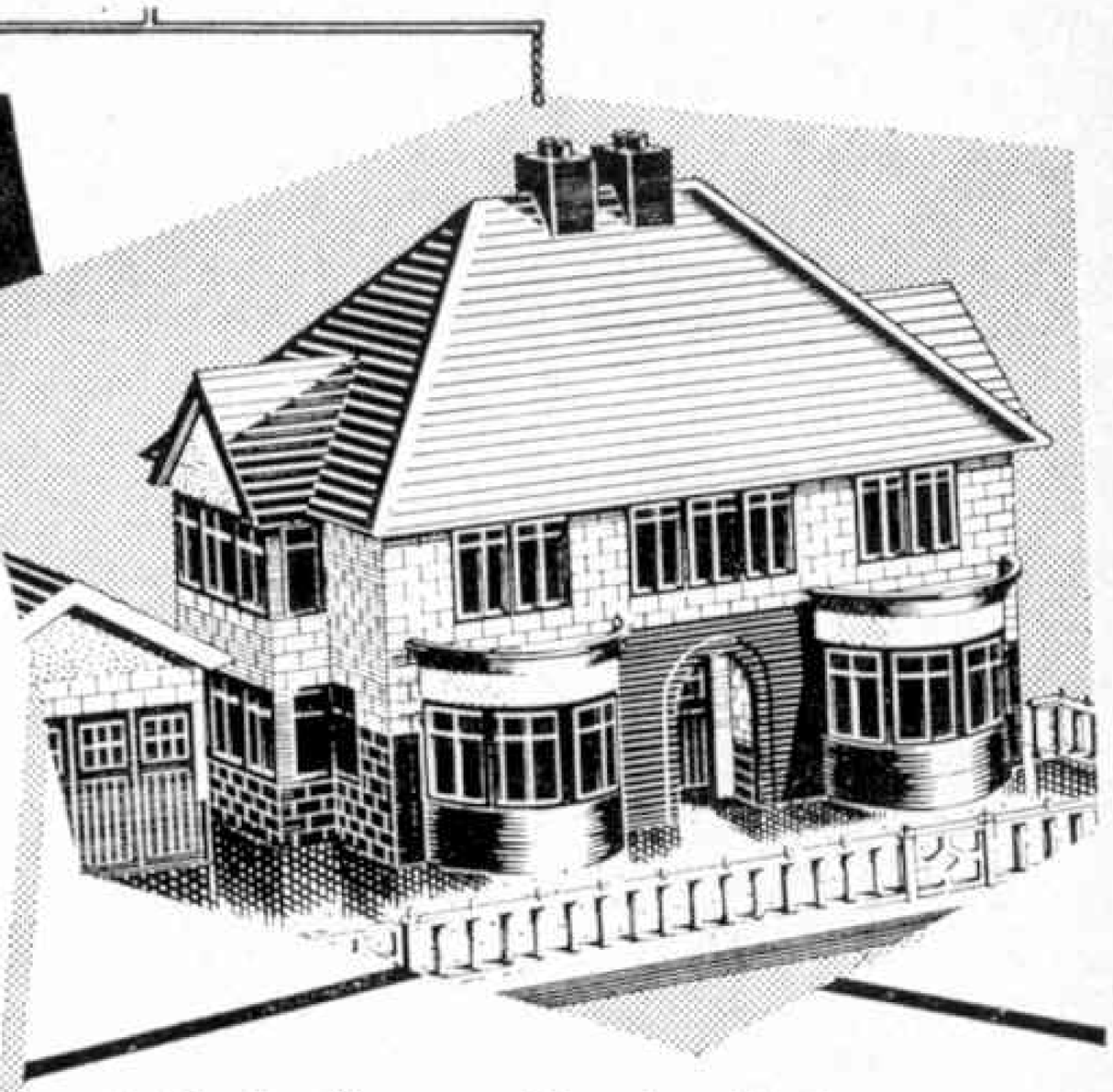


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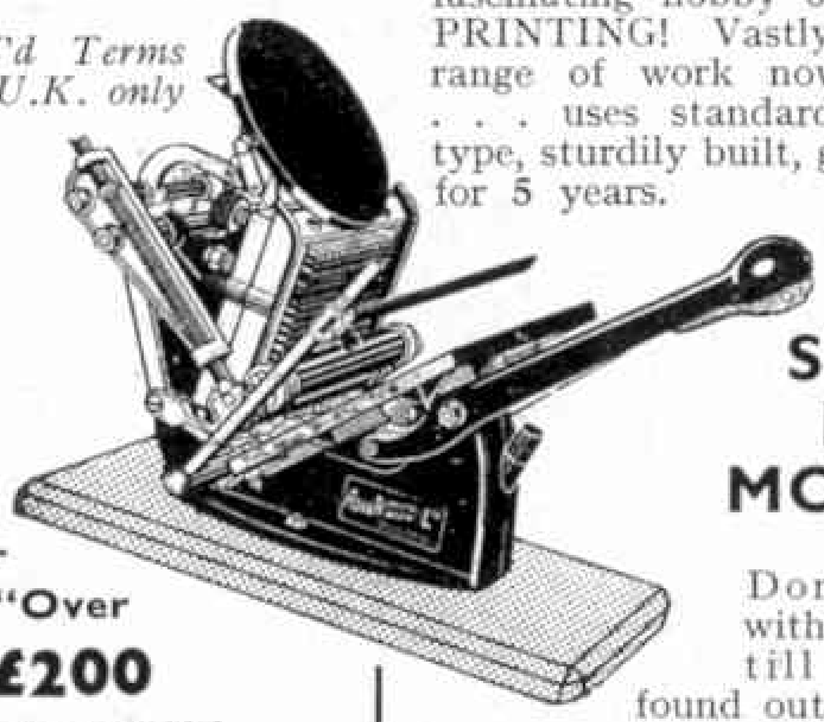
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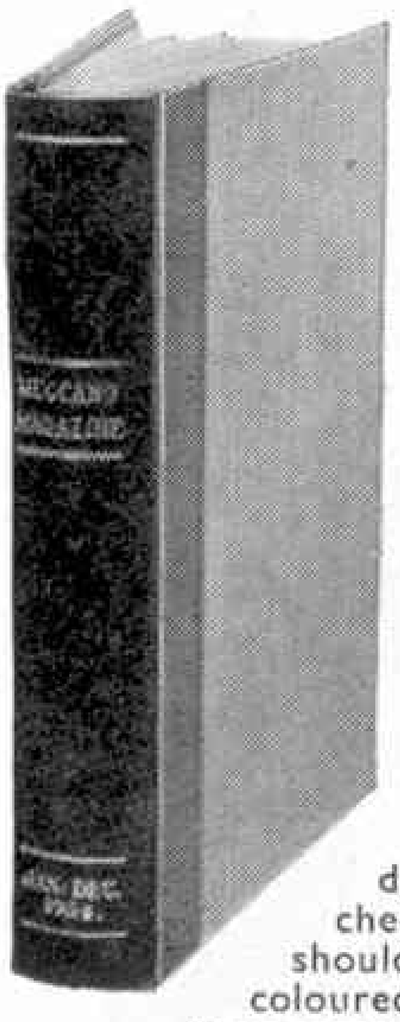
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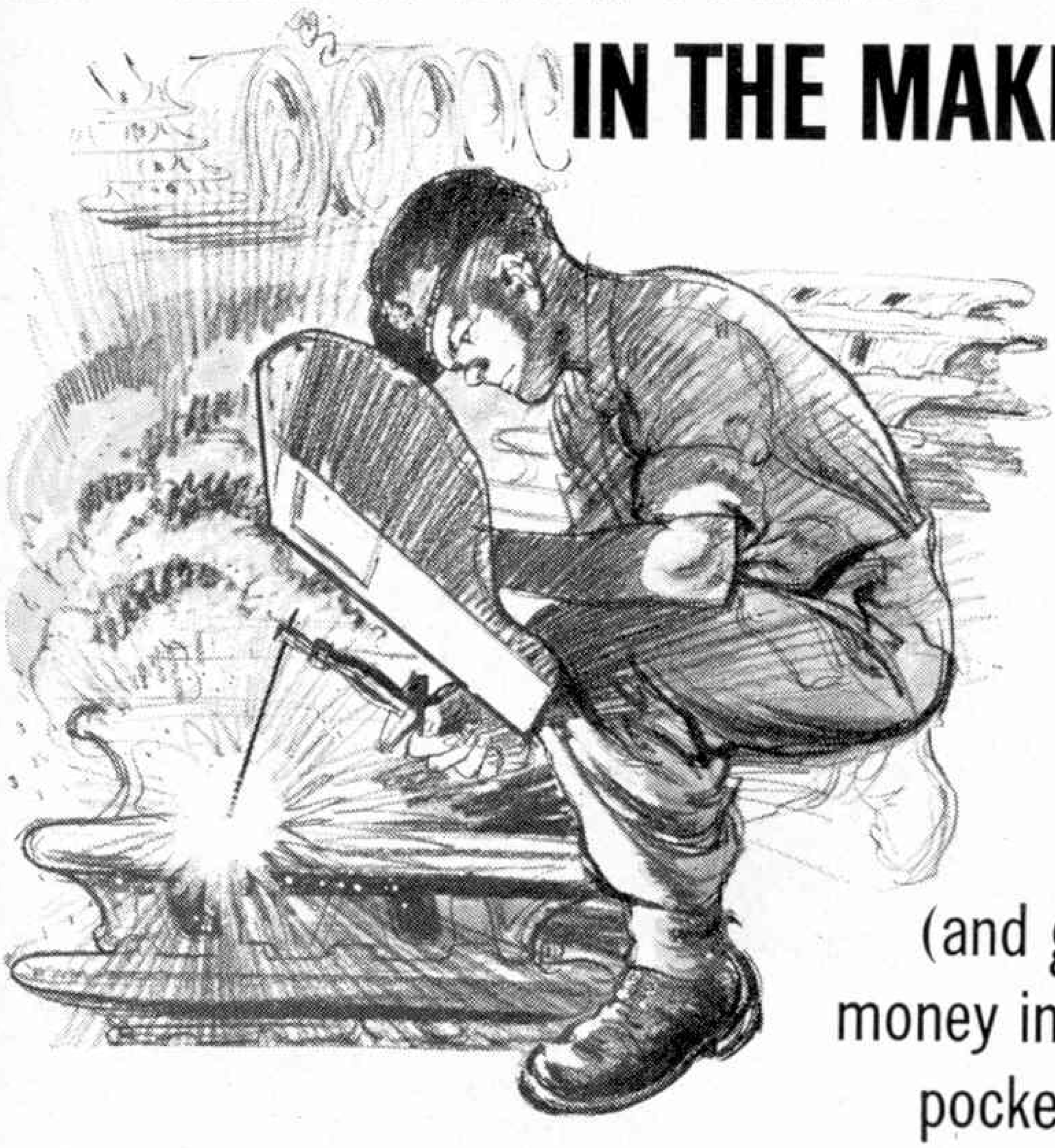


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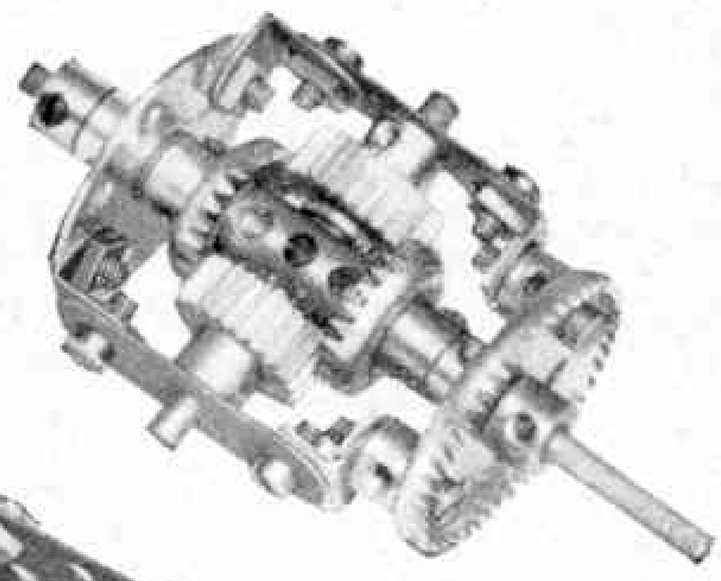
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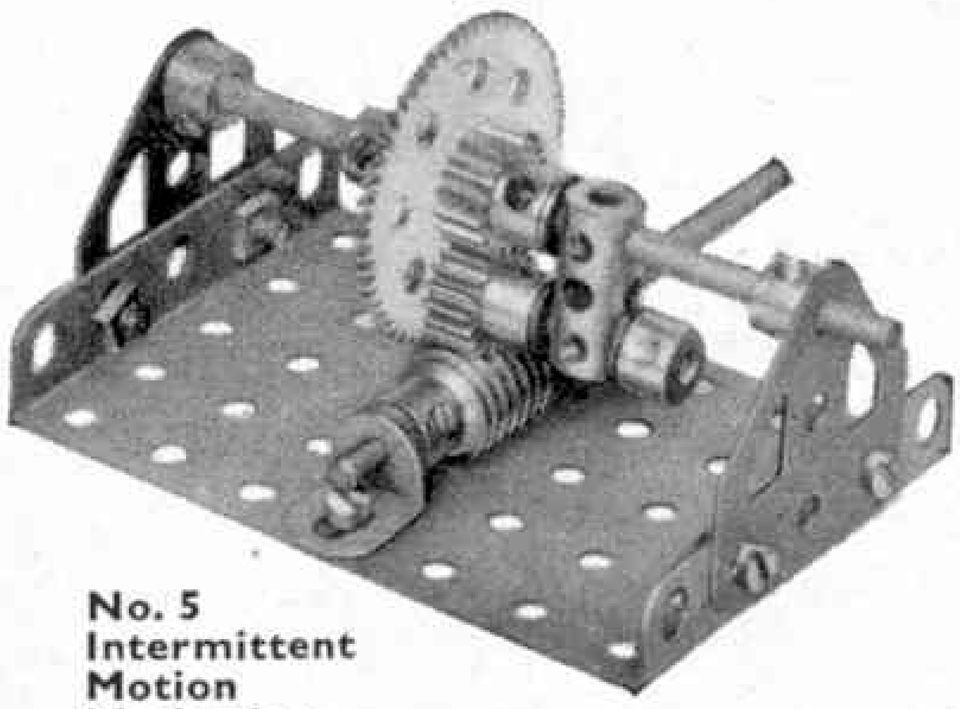
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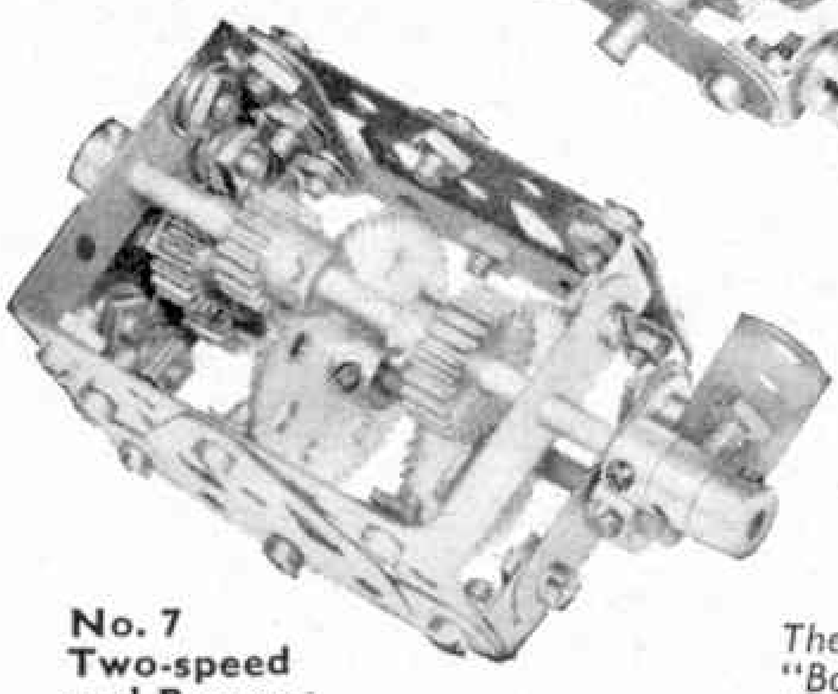
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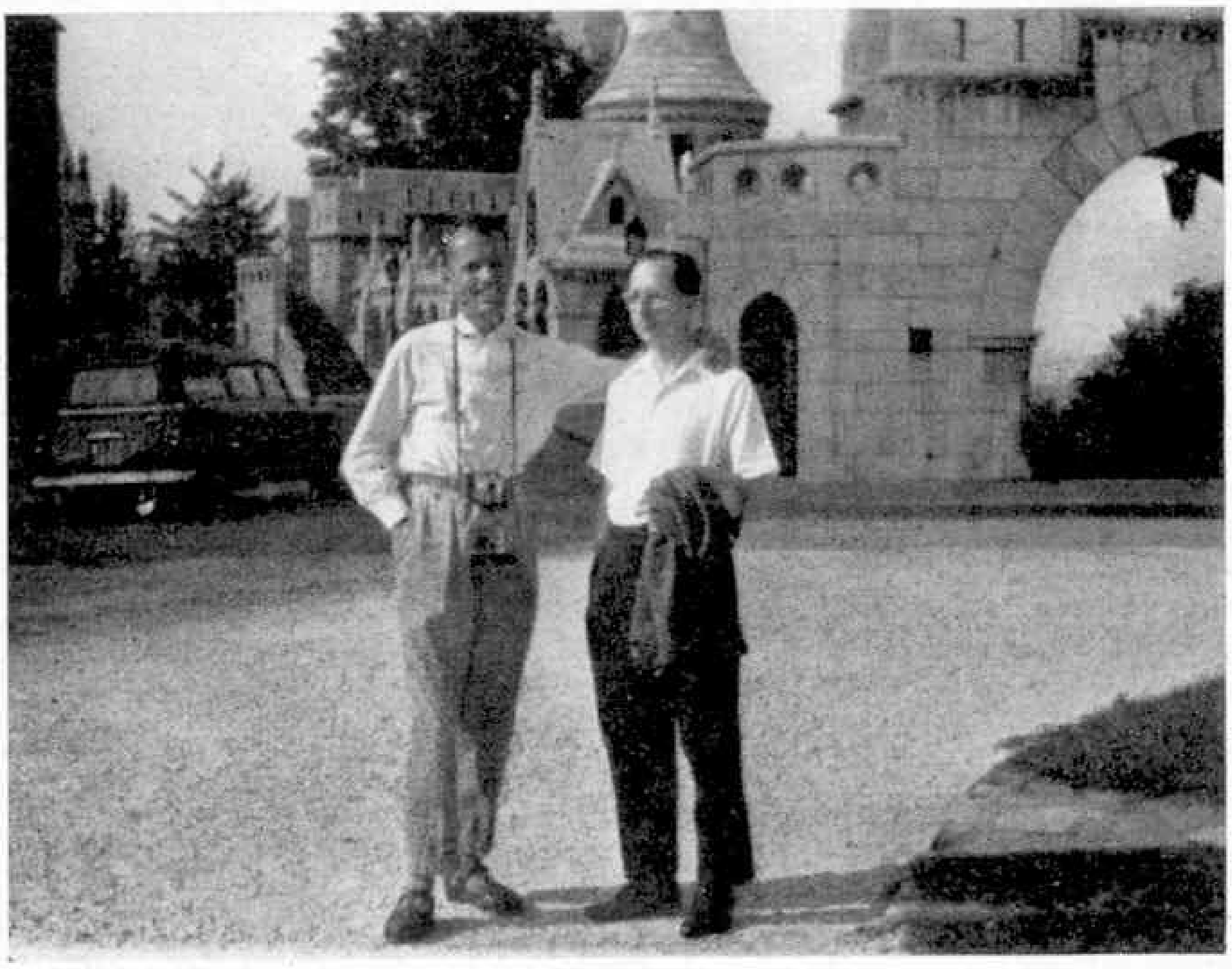
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December 1959

Christmas Round the World

A MERRY CHRISTMAS to everyone of you! This is a wish I have expressed many times over the past years, and I do so this year with the feeling that the ties between the *M.M.* and those who read it are closer than ever. This is shown in many ways, most notably in the large number of letters, often running into several thousands, that come into the Editorial Office every week, but never more clearly than in those I receive at Christmas time.

Christmas greetings between readers and myself are literally exchanged round the world. They come from the Pacific Islands and from New Zealand and Australia, where the day begins much earlier than in England, from such countries as Ceylon, India and Pakistan farther west, from practically everywhere in the Middle East, Africa and Europe. With them come others from the New World and those islands near the International Date Line, crossing the Pacific Ocean, which sees the end of Christmas Day some 12 hours after it has passed away from Liverpool. The Editorial Office, indeed, is nicely placed about the middle of the path of the great day itself round the Earth!



Two expert Model-Builders meet in Budapest, Hungary. On the right is Aldo Zaniboni, whose home is in Naples, and with him is Andreas Konkoly, who lives in Budapest.

My picture this month introduces one of a truly large number of examples I could give of the international spread of the Magazine. It was taken in Budapest, at the Fisherman's Bastion, a famous viewpoint over the Hungarian capital, and shows Andreas Konkoly, on the left, and Aldo Zaniboni, from Naples, both contributors to the Model-Building section of the *M.M.* The two met for a few happy days together last summer while the latter was on his way to Russia.

The Editor

Bangs for Bon-Bons

The Christmas Cracker Story

By Geraldine Mellor

WHAT a gay, colourful sight crackers present on the festive table at Christmas time. There can be few people, young or old, who do not enjoy pulling one of these cheerful, explosive toys; and it has been estimated that about 150 million crackers are pulled every Yuletide in Britain. Yet compared with the great age of many of our Yuletide practices, the habit of pulling crackers is comparatively new, for it has a pedigree of a mere one hundred years or so. Then, unlike other accepted Christmas usages, this custom is indulged in on other occasions during the year, though to a much lesser extent.

It is good to know that crackers are a purely English invention, though derived from a French idea. They were thought up by a young man with the prosaic English name of Tom Smith. He was an apprentice confectioner specialising in the making of sweets and cake ornaments. As soon as he had saved enough money, Smith struck out on his own, and before long became quite a prosperous confectioner. Now and again he would visit France to look for fresh ideas in order to attract more custom to his shop, and there in 1847, in a Parisian shop, he lighted upon some sweets that were wrapped in tissue paper, and called bon-bons, that were often given to guests at French society parties.

Smith liked this idea of wrapped sweets, and on his return to England, he improved on the notion slightly by wrapping sugared almonds not only in tissue paper in white, but in a variety of bright colours as well. He decided to display these bon-bons during the Christmas season, and they were an instant success.

Sales went down in the New Year, though, and so our enterprising confectioner thought up some original novelties to remedy matters. One of these was to wrap up printed kiss mottoes with the sweets. The following Christmas he added tiny toys, charms and inexpensive trinkets to his bon-bons; but he felt that he still required something even more unusual, yet attractive, to interest a much wider market.



School for Christmas cracker makers. The expert shows how, and doesn't forget to tuck the elusive motto inside.

It was Smith's log fire that at length solved this problem for him. Sitting before it one winter's night in 1858, half dozing, after thinking hard about his bon-bons, he was quickly jerked out of his drowsiness by the particularly loud crackling and popping of one of the logs in his grate, and suddenly he knew that he had found the answer to his problem. "That's it!" he cried, excitedly. "Bangs for bon-bons."

The very next day Smith began to work on his new scheme. What was wanted was something that could be wrapped with the bon-bons, and would explode with a noisy but harmless bang when they were opened.

During the next two years Smith carried out several experiments to try to produce what he wanted, and at last he hit on the idea of a strip of saltpetre to give the necessary explosion. And so at Christmas 1860, the very first crackers were sold, under the title of "Bangs of Expectation."

The general public went crazy over these brand new toys, and the following year Smith had to buy a much larger building in which to manufacture his unusual invention.



An explosion for export. This giant cracker was destined for British Honduras.

Soon crackers were being sold throughout the year, with sales increasing enormously at Christmas, and now the inventor substituted an attractive little present for the original sweets. When he died in 1868, his two sons inherited the business. They continued to develop the cracker, adding interesting new novelties inside, and making both the crackers themselves and the boxes in which they were packed increasingly ornamental and elaborate.

Quick to see the advantages of entering such a promising and prosperous market, other firms now started to manufacture these "Bangs of Expectation." But, curiously enough, the table cracker that is such a familiar sight on festive occasions today, did not come into its great popular favour until about 1912.

Early Christmas crackers were notable for frequently possessing a topical touch. For example, there were Darwin crackers, which provided much fun, and contained among other things "miniature monkeys of every description, and monkey masks causing uproarious hilarity when worn." Then the explorations of the Arctic undertaken by Nansen, Andree and Scott suggested the inclusion of "relics of the expedition, together with bear masks and other highly surprising novelties."

It is a heartening thought when so many of England's ancient handicrafts have disappeared, the younger craft of cracker making by hand is still with us after a hundred years, only the cheaper crackers being machine manufactured.

Many hand-made crackers are constructed by women, the most skilful of whom can turn out an average of 500 crackers a day—some of them working in their own homes. These hand workers use nine separate strips of paper to make these superior crackers. They include the foundation of semi-stiff white paper, crêpe paper for the cover, brightly hued transparent paper, and paper-backed foils.

After placing the motto and friction strip in position, the papers are wrapped around a metal tube, and then one end of the cracker is "choked" (Continued on page 574)



Keepers of the Beachy Head lighthouse sit down to Christmas pudding—and crackers. Radio Times Hulton Picture Library Photograph.



At Sea in H.M.S. "Victorious"

By John W. R. Taylor

H.M.S. *Victorious* is quite a small aircraft carrier by modern standards. Her full-load displacement of 37,000 tons is less than half that of the U.S. Navy's giant *Forrestal*-class attack carriers; her 781 ft. deck compares with their 1,047 ft. deck; and her steam turbines develop 110,000 s.h.p., against their 260,000 s.h.p. Yet, as a fighting ship she has no equal in the world.

What makes this even more surprising is that she is also quite an old ship. Ordered in January 1937, she was launched on 14th September, 1939, just 11 days after the start of the second World War, and served with distinction from 1941 onward. Her aircraft protected convoys sailing on the dangerous northern routes to Russia, attacked Japanese oil installations in the Dutch Indies and played their part in the grim island-hopping campaign in the Pacific that brought Japan to its knees. Enemy suicide-bombers slammed into her steel deck but, unlike the wooden-decked U.S. carriers, she was never out of the fight for more than a few hours.

Since the war her five sister-ships, the *Formidable*, *Illustrious*, *Indomitable*, *Implacable* and *Indefatigable*, have been scrapped; but *Victorious* herself was considered good enough to stay in service after modernisation, and this began in H.M. Dockyard, Portsmouth, in 1950. It took eight years and when the *Victorious* rejoined the Fleet in October, 1958, she was virtually a new ship above the waterline, having been completely rebuilt and re-equipped.

All the British inventions that have increased the fighting efficiency of our own and U.S. carriers since the war have been built into her. As a start, she is the first ship of the Royal Navy with a fully-angled ($8\frac{3}{4}^{\circ}$) flight deck, which now overhangs the port side by 35 ft. 6 in. Two parallel 145 ft. steam catapults have been installed on the foredeck, two mirror sight landing aids amidships, and the latest type of arrester gear aft.

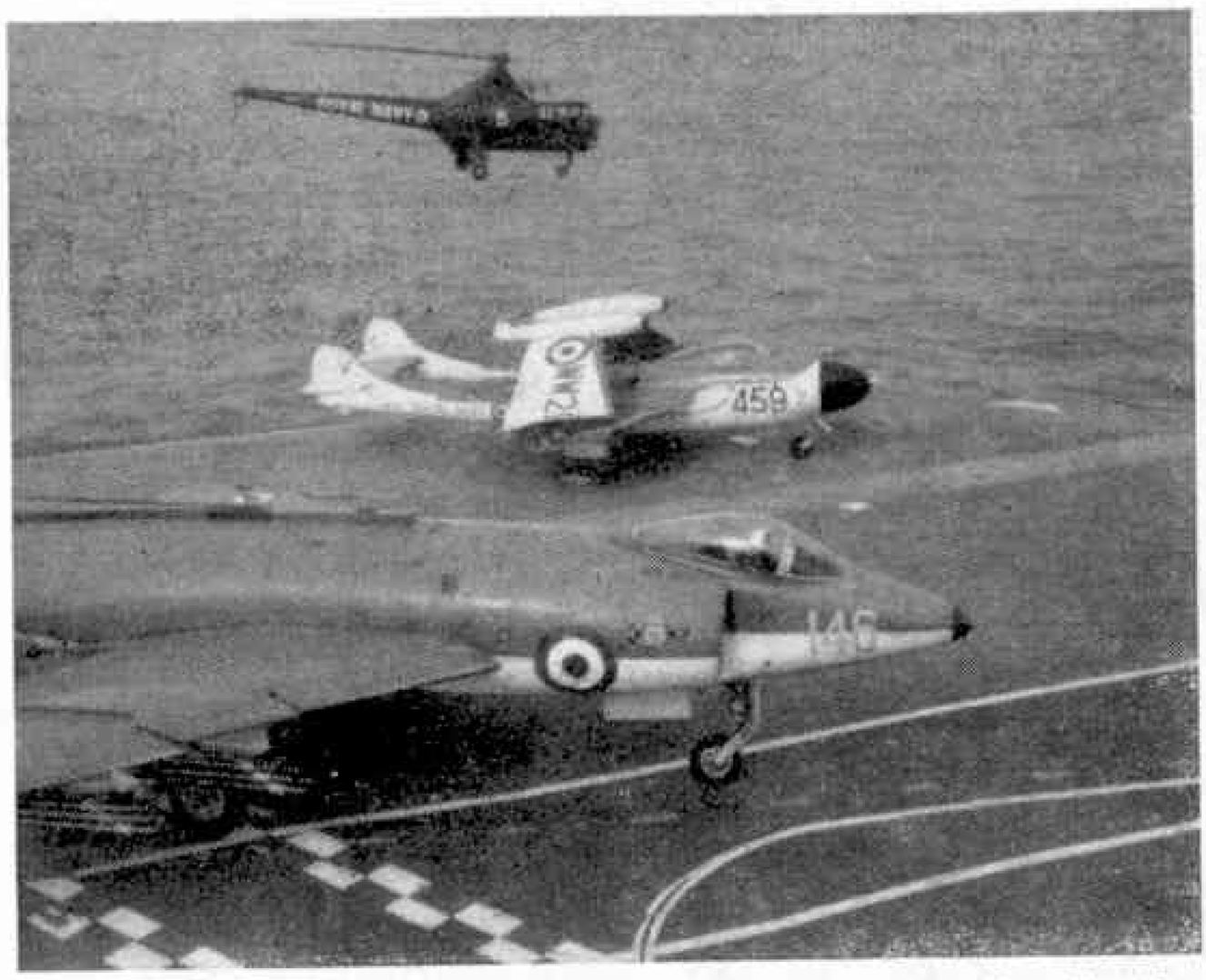
Even more important is the wonderful new radar, the huge drum-like aerial for which seems to dominate the ship's appearance from every angle. It was the first thing that caught my eye when, with a party of press-men, I sailed towards the *Victorious* at Spithead a few weeks ago. For the rest of the day it seemed to be in the background of almost every scene on the ship, as it turned continuously on the "island" superstructure, forward of the funnel.

When I spoke about it to Captain H. R. B. Janvrin, D.S.C., he explained tactfully that it was the one part of his

ship about which I must not ask too many questions. All I can tell you is that it can detect aircraft while they are still a very long way away, and work out their range, bearing and height more quickly and accurately than any other ship-borne radar in the world. With it, in the operations room, goes a new display system, which enables the controllers to sort out speedily the identity and intentions of every aircraft in the air over a great radius around the ship, so that they could make the best possible use of the six squadrons of aircraft that would be carried in wartime.

This brings us to the very important question of what ships like the *Victorious* can do in an atomic age. We hear a lot of piffle about the carrier being out-of-date and far too easy to sink to be of any use in modern war. In fact, its ability to move anywhere across two-thirds of the Earth's surface at over 30 knots means that, unlike a land aerodrome, it first has to be found before it can be attacked. The difficulty of doing this can be gauged from the fact that only one of the 63 carriers used by the Royal Navy in the second World War was sunk by air attack, and then only after she had put her aircraft ashore to protect land targets.

Main tasks of the Royal Navy, as in the past, are to escort and protect convoys of food and supply ships, to put ashore army units where they are needed, and to provide them with close support in action. A further important job is to attack enemy targets on shore, but the Royal Navy does not regard its carrier-based bombers as a rival force to the R.A.F.'s V-bombers for strategic attack.



One of the Dragonfly helicopters of H.M.S. "Victorious" at "action station", ready to rescue any pilot unfortunate enough to "ditch" his aircraft—a very rare occurrence. On deck is a Scimitar and, in the centre of the picture, one of the Sea Venoms.

My day in the Channel in H.M.S. *Victorious* left little doubt of how well the Royal Navy could carry out these duties. On board were No. 803 Squadron of Scimitar single-seat fighters, Nos. 831 and 893 Squadrons of Sea Venom two-seat all-weather fighters, B Flight of No. 849 Squadron with Skyraider early-warning radar aircraft, and the ship's own Dragonfly search and rescue helicopters. This sounds like a lot of aeroplanes for a comparatively small ship to carry, and it looked a lot from my perch high on the "island" superstructure.

What made the deck seem even smaller and more crowded was the great size of the Scimitars, which have a length of 55 ft. 4 in. and weight of around 40,000 lb., compared with a length of 39 ft. 8 in. and weight of 16,200 lb. for the Sea Hawks which they have replaced. The increase of

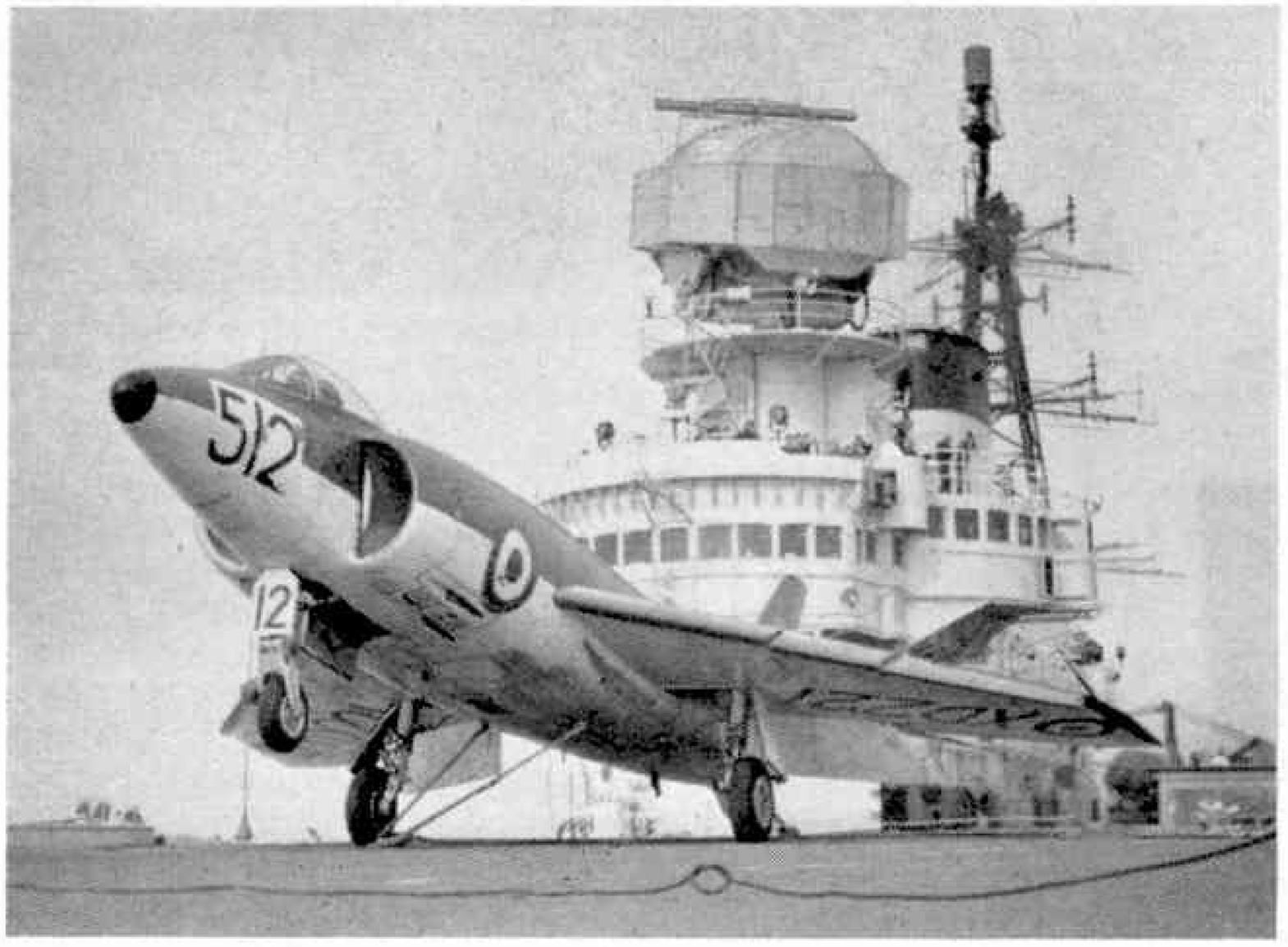


Aircraft—mostly Scimitars—lined up on deck, awaiting take-off.

power, from a single 5,400 lb. thrust Nene turbojet in the Sea Hawk to two 11,250 lb. thrust Avons in the Scimitar, is even more impressive, as I was soon to discover!

There were sudden puffs of smoke from the fuselage of every Sea Venom on deck, as the pilots fired the cartridges of their engine-starters in the same split second. Then the Scimitars also were started, and the air became filled with the whine of dozens of idling engines.

The first two Scimitars began taxying slowly forward towards the steam catapults. At the same time a Dragonfly helicopter took up station just off the port side of the ship, about 100 ft. above the sea, and stayed there as if fastened to the end of some invisible mast. If any mishap had occurred, its highly-skilled crew would have been able to haul the pilot of a "ditched" aircraft out of the sea in a fraction of the time taken by the destroyer which was used for "plane guard" duties in the old days; but accidents are extremely rare and all went smoothly—if not quietly!



A Scimitar on the starboard catapult of H.M.S. "Victorious". The nose is held high off the deck to put the aircraft in the best attitude for a quick take-off. Crown copyright. Official Admiralty photograph.

Remembering what it was like in the "Goofers' Gallery" on the island when I had a trip in H.M.S. *Ark Royal* a few years back, I had stuffed cotton wool in my ears to keep out some of the noise; but the Scimitars on *Victorious* were a very different proposition from the *Ark's* Sea Hawks.

Each aircraft in turn was hooked on to the steam catapult. Its pilot made a final check of the controls and instruments, gave the thumbs-up signal to show he was ready to go and opened up the throttle wide. Solid waves of hot air blasted back at us, almost sweeping us off our feet although we were well behind and above the aircraft. The noise became almost unbearable, and we realised why the men on deck need special sound-proof helmets and talk to each other by radio and hand signals.

One of them dropped his arm to indicate "let her go", and almost before we knew what had happened the first Scimitar had streaked along the deck and was climbing away steeply, with twin streams of black smoke trailing from its exhausts.

As we watched, it was easy to understand why the Navy need have little fear of air attack now that it has aircraft like the Scimitar in service. Long before any enemy came near enough to drop bombs, it would be picked up by the great spinning radar aerial and the radar-carrying Skyraiders circling high over the Fleet. Within minutes the Scimitars could be on their way to shoot it down, flying almost at the speed of sound. Nor is that all, for these same aircraft can carry a heavy load of rockets and nuclear weapons for low level strikes against ship and shore targets.

We were able to watch a demonstration of this side of their job. One after the other, at tremendous speed, six Scimitars dived towards a floating smoke target and smothered it with rockets and cannon fire. Another one showed the technique used to deliver atom bombs, by roaring up into a vertical climb and tossing a small practice bomb high into the air as it went. Long before the bomb had had time to curve over in a long arched trajectory and explode on the water, the Scimitar had completed a half-loop and was disappearing far away in the opposite direction.

Sea Venoms also attacked smoke floats with rockets and cannon fire. A man went down a rope from the Dragonfly into the water to "rescue" a dummy and show us how quickly a "ditched" *(Continued on page 574)*

Santa Claus—Past and Present

By Arthur Gaunt

TODAY we invariably regard Santa Claus as a portly jovial person always ready for a merry jest. Yet less than 150 years ago this popular Christmas character was looked upon in quite a different way.

The original Santa was, of course, St. Nicholas, who lived some 1,600 years ago in what is now Turkey and was for seventeen years Bishop of Myra. He was known far and wide for his great piety, kindness and generosity, and became the patron saint of children when he miraculously restored to life two boys who had been attacked by brigands and left for dead.

Nevertheless, until well into the 19th century Santa Claus was generally pictured as a somewhat staid, formal gentleman who handed out Yuletide gifts with an air of solemnity. It was an American tutor, Clement Clarke Moore, who, in 1822, put the twinkle in Santa's eye and gave him a merry laugh. To amuse his own family, this professor of Greek and Hebrew composed a poem under the title *'Twas the Night Before Christmas*. The verses not only gave Father Christmas a much more likeable personality, but introduced other ideas about him that have since become world-wide traditions.



Santa Claus on a stamp. This design was used on a series of Cuban stamps issued in 1954-55.

The poem tells how Santa was something of a magician, who toured the snow-covered countryside in a sleigh drawn by reindeer, skimming the roof tops and dropping his gifts down chimneys. But above all they introduced him as a plump, jolly fellow instead of the stolid unsmiling individual he had so far been pictured.

Clement Moore's poem enthralled his family circle, but it would probably have remained unknown elsewhere if a relative had not sent a copy to a small-town newspaper. It was printed in the Troy *Sentinel* at Christmas the following year, and later swept through the U.S.A. as the most popular Yuletide poem ever written. Today it still re-appears Christmas by Christmas, in magazines, newspapers, and children's books, not only in America but all over the world. In that way the verses have revolutionised our celebration of Christmas. From them have come our modern St. Nicholas, the reindeer, and the child's idea of a happy Yuletide.



The making of Christmas stockings and filling them is an activity that has to be carried on throughout the year to meet the demand.

In recent years Santa Claus has assumed a still more novel guise. He has become airborne in a different fashion, in some instances having replaced his sleigh with an aeroplane!

Nearly twenty years ago an American philanthropist bought a plane and engaged a pilot to fly over every lighthouse, lightship and coastguard station between Boston



Was this the "largest ever" Christmas stocking? Photograph by courtesy of Tom Smith and Co. Ltd.

(Mass.) and the Canadian border. Over each of these the flying Father Christmas released a small parachute bearing a parcel crammed with seasonable fare. More recently the same aerial Santa has delivered similar packages to Alaskan radio stations cut off by deep snow at this time of the year.

Another isolated spot that Santa nowadays tries to reach by air at Christmas is the remote island of Tristan da Cunha, in the South Atlantic. At St. Moritz, Switzerland, he has descended by parachute himself alighting on a frozen lake and then continuing his journey by the traditional sleigh.

Santa has appeared on postage stamps in some parts of the world, too. An example of this from Cuba, issued in 1954-55, is reproduced on the previous page, and reference to it is made also in the Stamp Collecting article on page 571.

In fact, Father Christmas has influenced postal services more than you may think. One of the busiest post offices at this season is at a little town in Indiana. As many as 4,000,000 Christmas letters and greetings cards are franked at this place every December.

The reason? Well, the town is called Santa Claus, and many people think it a nice gesture to have their Yuletide mail re-addressed there, so that it carries the Santa Claus postmark.

The conversion of the name Saint Nicholas to Santa Claus appears to have occurred in America, too. At any rate, the earliest known usage of the latter name was by Dutch settlers in New York 300 years ago, when the city was called New Amsterdam.

Yet they could not have foreseen how varied his activities were to become in this 20th century. Today there are even schools for prospective Father Christmases. Here those who are to play the role of Santa Claus in big stores and at children's gatherings receive training for their job. Students are accepted only if they are of the right build and girth. They must have a "Santa Claus voice", are taught the "Santa Claus walk", and learn how to answer awkward and embarrassing questions.

Training includes practical lessons among a jostling crowd of children who are encouraged to test Santa's temper. Student Father Christmases who pass the final examination are given a B.S.C. degree—Bachelor of Santa Claus!



Post offices work overtime during the Christmas season. Photograph by courtesy of H.M. Postmaster-General.

The Christmas stocking is another feature of Yuletide that we owe to the white-whiskered gentleman. The good Saint Nicholas is said to have liked to distribute his bounty anonymously. On one occasion, when he heard that the three daughters of an impoverished nobleman were unable to marry because their father could not provide them with dowries, the Saint dropped three bags of gold down the chimney of their home to relieve their distress.



Those who wish to become representatives in large stores of Santa Claus have to go to school to learn the business. But they will never know as much as old Santa himself does.

In course of time it became customary for peasants to encourage the Saint's generosity by hanging up a stocking in place of a money bag to receive the gold.

Santa Claus is regarded so seriously nowadays that thousands of letters written to him by children find their way to postal sorting offices. They are addressed to the North Pole, Reindeer Land, Lapland, and other places where Father Christmas is supposed to live. Up to 10,000 such letters sometimes reach the London Returned Letter Branch of the G.P.O. during December. They contain requests for special gifts, the young writers believing that by approaching Santa direct through the post their wishes will materialise.

In Britain there are no special official arrangements for dealing with this correspondence. The regulation procedure is for the letters to be opened and returned to the senders, if they bear the writer's address. But doubtless this method often has the desired effect, and the gifts materialise on Christmas Morning.

Exceptions to the rule occur occasionally when the postal staff open a particularly pathetic letter. Then they may make a collection and arrange that the child shall not be entirely disappointed.

Other countries have a different system. In the U.S.A., correspondence addressed to Santa Claus is often handed over to charitable organisations. The circumstances are investigated by these bodies, and in cases of genuine poverty they assume the role of Father Christmas.

In fact, about one quarter of the 5,000 Santa Claus letters posted every Christmas in New York alone bring a response that delights the young writers. The name "Santa Claus" appears several times in the official rule-book of the U.S. postal service, and postmasters are instructed to take every possible care of such correspondence.

Denmark has introduced a more novel idea whereby children may write to Father Christmas and get a letter in reply. Christmas seals are sold, and one of these is put on the envelope addressed to *Santa Claus, Greenland, Denmark*. The letter is also stamped for mailing in the usual way, and in due course an answer is sent by the Old Gentleman.

The money paid for the seals is used to help sufferers from Tuberculosis. The scheme thus serves a double purpose, giving pleasure to children and helping to relieve ill health.

Austria has a post office known as "Santa Claus's Own," officially Christ Child or Christkindl. It is open only during December, and all the mail despatched from this source is postmarked *Christkindl —December 24*. As at the Indiana township of Santa Claus, thousands of letters and Christmas cards are received there to be franked and re-posted each Yuletide.

Oddly, St. Nicholas's Day is not the 25th of December, but the 6th, and it has never been satisfactorily explained just how the former date was chosen for Christmas Day.

Railway Notes

By R. A. H. Weight



"The Talisman" leaving King's Cross for Edinburgh behind A4 No. 60006 "Sir Ralph Wedgwood". Photograph by M. Edwards.

Aboard the "Broadsman"

Around two years ago this 3.30 p.m. Liverpool Street–Norwich express was the "flyer" of the Great Eastern Section, E.R., covering the 115 miles with Ipswich stop in 2 hrs., and requiring an average speed well over 60 m.p.h. from the latter town to Norwich arrival. It still has that fast schedule, but so extensive has been the general speed-up of East Anglian main line and connecting services on a more frequent, regular interval basis during 1958–9 that there are now four similar 2-hr. trains in each direction. They leave London and Norwich at 3-hr. intervals, with sharply timed hourly semi-fasts in between.

The *Broadsman* northbound was a fine 9-coach maroon train, nearly full, of about 340 tons gross weight when I travelled on it. A very fast start was made up the hill to Bethnal Green and through Stratford, and we touched 74 m.p.h. before Manor Park. There was a track-repair slowing at Seven Kings, and then came the long rise to Brentwood summit, the final steep pitch being breasted at 50 m.p.h., when a yellow warning signal had been sighted. There was a short signal stop before Shenfield station, another 9¾ miles on outside Chelmsford after 79 m.p.h. downhill had been attained, and soon followed a slack where drainage works were in progress.

Four delays in the first 32 miles were serious and we had lost 6–7 min., but there was no further hindrance. The Stratford driver set about regaining time and No. D 203 2,000 h.p. 1 Co-Co 1 diesel-electric locomotive was able to provide quick acceleration and lively uphill work, reaching Ipswich only 2¼ min. late. Maxima of 83, 87, and 81 m.p.h. downhill had been attained, and a climb at 60–62 after easing through Colchester on account of the curve.

The Ipswich stop was cut from 3 min. to 2, and then we were off on the G.E. line's fastest booking—46¼ miles to Norwich in 44 min. This was actually completed in 42 min. at a start-to-stop average of 66 m.p.h. Typical of the fast running along this undulating stretch by steam Britannias or large diesel locomotives, was the average of 80 m.p.h. for 17 miles, with top speeds of 86–87 and a mean of 74 m.p.h. over 40 miles to Trowse Junction, whence a gentle approach was made to the Thorpe terminus. Up Haughley bank, around 14 miles from Ipswich, the minimum was 66 on the 1 in 134.

This express goes through to Sheringham, in north Norfolk, over partly single track and steeply changing gradients, reversing at Norwich and Cromer. The 4–6–0s employed for those stages calling at intermediate stations were B1 No. 61317 to Cromer and B17 No. 61636 *Harlaxton Manor* for the short coastal section beyond. Timings have since been increased.

From My Summer Notebook: G.N. Line

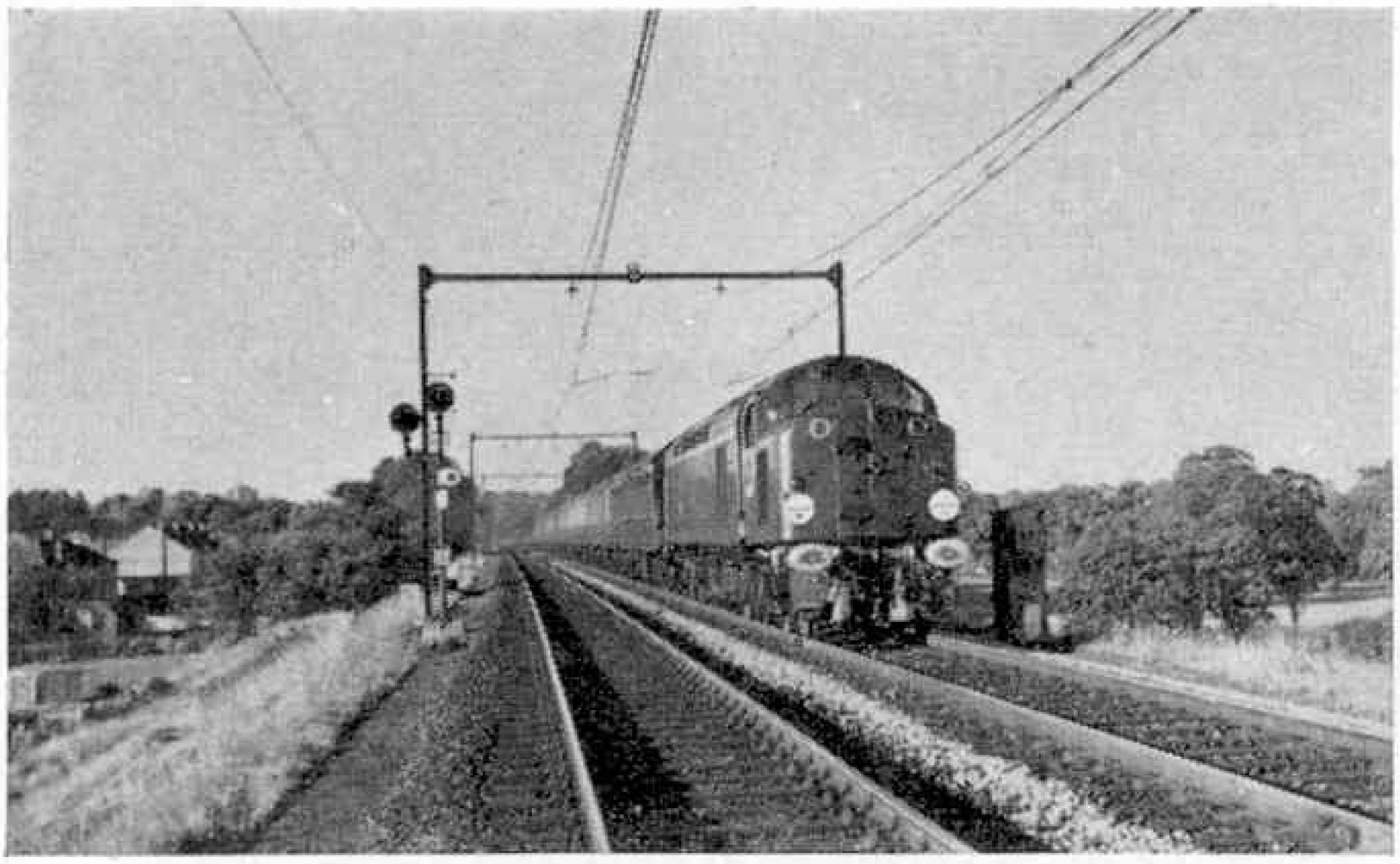
The southbound *Norseman* conveying passengers from Norway, landed and transferred to this fine train at Tyne Commission Quay, Newcastle, was running late when I boarded it on a busy Saturday and behind A2 4–6–2 No. 60502 *Earl Marischal* suffered signal delays south of York. From Grantham, however, after the King's Cross streamlined Pacific No. 60006 *Sir Ralph Wedgwood* had taken over the 12-coach express weighing about 425 tons in all, every signal was clear until a slowing was necessitated outside the terminus. There was also a slack owing to engineering work near Sandy, but over 10 min. were regained. The maximum speed down the Stoke descent was 85 m.p.h., and the overall time for the 105½ miles Grantham–King's Cross was 114 min.

On another peak August Saturday this year, during a period of about 6 hrs., express and main line trains through Hertfordshire, etc., to and from King's Cross were hauled by 30 different Pacifics, comprising 8 A1s, 3 A2s, 10 A3s, 9 A4s. There were also 10 V2 2–6–2s, 6 B1 4–6–0s and 1 K3 2–6–0, with 3 2,000 h.p. D 200 class locomotives. Type 2 diesels were numerous on suburban, Cambridge or similar semi-fast trains. There were B.R. 2–10–0s on empty coaching stock and fast freight trains.

Much of the timekeeping was good considering the intensity of the service, and some of the corridor, restaurant-car trains had "13-on". No. 60031 *Golden Plover* from Haymarket shed, Edinburgh, was on the southbound Saturday version of the *Elizabethan*, with a heavier load. Other A4s following soon after were *Silver Link* on the *Flying Scotsman*, also booked non-stop from Newcastle, *Quicksilver* from Doncaster with a Hull express, and *Dominion of Canada* on the *Northumbrian*.

On a Thursday, when the ordinary weekday partially faster and different service was operating, the last-named streamlined Pacific was in King's Cross 8 min. early on the 60 m.p.h. *Tees–Tyne Pullman* from Darlington and Newcastle. The very powerful English-Electric *Deltic* diesel was noted to time down the line after track repair slowings on the 1.49 p.m. Doncaster–King's Cross, as part of two daily round trips from London to Doncaster and back. A2 and A3 Pacifics also very prominent on fast trains to and from the north.

It was learned that from the Scottish end A4 No.



English Electric 2,000 h.p. diesel No. D 205 on a Norwich–Liverpool Street express near Ingatestone. Photograph by R. F. Roberts.

60027 *Merlin* made 40 daily runs without a break over the 393 miles between Edinburgh and King's Cross on the *Elizabethan*, or its Saturday-Sunday one-stop equivalent.

East Anglian Diesel Explorations

From seats in front, with fine views through the large windows of the track, signals ahead and passing trains as well as of the pleasant seaside, Norfolk Broads and varied country scenery traversed, most of my journeys in two-coach diesel units in East Anglia were very entertaining along both main and branch routes. They feature 60 m.p.h. speeds along single or double lines, with rapid acceleration from stops.

The Cromer–Sheringham–Melton Constable line is very attractive. It winds to and from the Beach station round the back of Cromer town amid woods and there is a triangular junction. Melton Constable, until recently an important junction with the one-time Locomotive and Rolling Stock Works, has become just a terminal stub on the ex-Midland and Great Northern Joint line. There that system's "somersault" signals are still in use.

I also went from Cromer to Norwich, and then out again with glimpses of riverside scenes and gay station or other gardens, via Reedham to Yarmouth, Vauxhall station, which dealt with greatly increased holiday traffic to and from the Midlands and North last summer, consequent upon the closure of the M. and G. N. route. Many such trains, also from London and the south, avoid the busy Thorpe terminus and reversal in Norwich by use of the Wensum curve, being able to proceed thence by way of four different, or partially different coastal lines, partly single track, to Cromer or beyond, Yarmouth via Acle or via Reedham and Lowestoft via Reedham. Each can also be reached from Norwich terminus with diesel services.

From South Town, Yarmouth's other G.E. Line terminal, I continued by diesel along the coast through Gorleston and past holiday camps on the cliffs to Lowestoft. After prompt station work and reversal out again, I went on to Beccles, and thence my train travelled as a slow one through Saxmundham and Woodbridge to Ipswich, 59 miles that way from Yarmouth, along the East Suffolk secondary main line. Seeing for myself the driver's range of visibility, I was able to realise what an extraordinarily difficult course this is for the heavier trains and steam locomotives, so sharply changing and severe are the gradients. We passed a Britannia working through from Liverpool Street. The Lowestoft route is to be the regular one for all trains 'twixt Beccles and Yarmouth.

Winter Train Services

With later introduction this year and unavoidable delay in publication of some timetables, full details of winter services were not available at the time of writing, but it had been announced that a new *Tees–Thames* express would commence in November, with other changes providing a fast Saltburn–Middlesbrough–King's Cross service and more diesel trains on the G.E. Line, including the cross-country route through Bletchley, L.M.R., to Oxford, W.R., from Cambridge. Diesel services have also been extended in the Midlands and North. The *Talisman* expresses are continued twice daily in each direction, Mondays to Fridays, providing the quickest journeys between Edinburgh and London, King's Cross, in winter—in less than 7 hrs.

Rather startling changes on account of much pre-electrification structural and track work, which necessitates Engineers' possession of certain lines between Euston–Rugby–Birmingham–Crewe, include the withdrawal of London–Birmingham–Wolverhampton express services by that route, together with a number of other alterations.



More than 103,000 people visited this B. R. Exhibition at Glasgow Central. On the left is one of the new electric trains for the Glasgow suburban electrification, which will be in operation next year. B. R. (Scottish Region) Official Photograph.



Heavy Loads by Hilly Routes

Road Transporter 140 ft. Long

By Robert Garvie, B.Sc., M.I.C.E.

Here is the story of a low loader of ingenious design built for carrying heavy machinery over rough roads with sharp corners. The picture at the head of the page shows the vehicle about to turn a corner. With its two tractors, one in front and one behind, it makes up a length more than twice that of a cricket pitch.

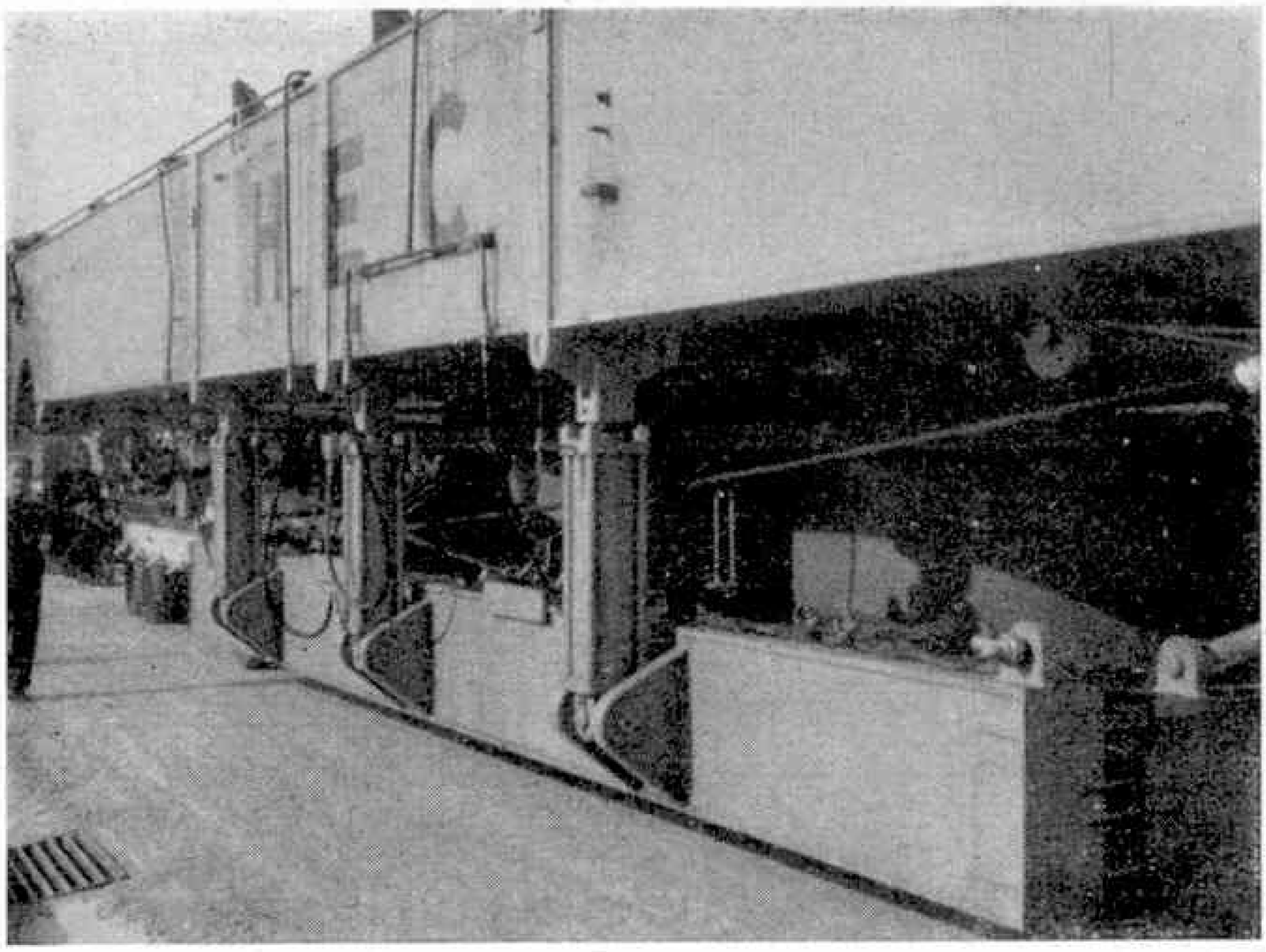
THE individual items of electrical and mechanical plant for power stations, oil refineries, and similar installations are tending to become larger and heavier every year. The reason is that it is usually more economical to construct as much as possible of a complicated piece of machinery within the parent factory, than to despatch a number of component parts for assembly on the site. Construction in the factory means better working conditions, simpler fabrication processes, and a closer control at all stages. These advantages usually outweigh the cost and difficulty of transporting outsize plant.

The transport of heavy and oversize items involves the use of special vehicles, such as low-loaders with several axles to distribute the weight over the road surface. Transporters of this type have become so common in industrial countries as to be regarded as "standard" rather than as "special" vehicles, but circumstances can still arise in which a new and unorthodox design is required.

A problem of this kind faced the engineers of the Tasmanian Hydro-Electric Commission, when two transformers weighing 83 tons each had to be transported from ship to sub-station by a narrow winding road that included sharp corners and S-bends, slopes across the road, such as crossfalls and cambers to poor road edges, and gradients of 1 in 7, while most of the way the surfaces were of gravel.

On this road any standard type of low-loader would have been in danger of overturning with its comparatively high, narrow, and heavy load; and the risk would have become a certainty had the edges of the road subsided, or had tyres blown on the lower side of a severe crossfall. A special transporter was therefore designed, "tailor-made" for this first difficult task, but capable also of use in ordinary circumstances. It was constructed in the Hobart workshops of the Hydro-Electric Commission.

The carrying unit consists of two long side girders, of steel box section, resting on



The side of the low loader presents an impressive picture.

cross beams at each end, and braced across when fully assembled for use. Suspended from the central section of the girders are six hydraulic jacks, to pick up and support the load on its pads. The jacks are all synchronised and can not only raise the load from the ground, but can be adjusted during a journey if necessary, as when crossing uneven ground for instance.

The cross beams are carried on turntables resting on the trailer platforms, and the side girders can pivot on the cross beams. Thus the unit can run on highway curves both up and down and crossways.

Four hydraulic jacks under the two end cross beams control the tendency to sway, and the jacks in turn are actuated through a hydraulic servo mechanism controlled by a pendulum. As the unit begins to take a cambered corner, the movement of the pendulum sets the system in motion, and the girders and their load remain vertical and stable. This sensitive control is accurate to within two degrees of the vertical, and the transporter can negotiate short crossfalls of 1 in 4 in opposite directions, as may occur on short S-bends.

The main girders can be handled by a long-jib mobile crane at one end and the towing unit at the other; the unit is drawn round the load to be carried, which it then lifts with its own jacks. At the end of the journey, the load is lowered on to its prepared foundation, and the girders are withdrawn with the assistance of the mobile crane.

The ends of the girder assembly are carried on orthodox low load trailers, with two Diamond-T 210 H.P. prime movers or tractors, one pulling and the other pushing. A total of 60 wheels distributes the load, and the overall length of the full unit is 140 feet.

The team working the transporter numbers five. These are the officer in charge, two vehicle drivers, the trailer steersman and a general assistant.



The officer in charge of the cavalcade has a rear offside seat with the controls of the hydraulic system handy.



Road and Track

By Peter Lewis

AT the time of writing no one seems to know whether or not the American G.P. will take place on 12th December. If it is not run, then Jack Brabham will be Champion of the World, a driver who had never won a championship event until this season. Never has so much been achieved in such a short time.

If the American race takes place, then Stirling Moss has a chance of wresting the title from Brabham, for there have been seven 1959 championship events and at the conclusion of the season, the points obtained by each driver in his five best races are added together.

The picture at the head of the page shows the sleek, purposeful Aston-Martin D.B.4 G. Turismo, the fastest touring car ever offered by a British manufacturer.

This is how the table stands at present, both Moss and Brabham having already scored in five races:

	Moss	*Brabham*	*Brooks*
Monaco ..	–	9	6
Holland ..	1	6	–
France ..	1	4	8
Britain ..	6½	8	–
Germany ..	–	–	9
Portugal ..	9	–	–
Italy ..	8	4	–
Total ..	25½	31	23

If Brabham wins at Sebring, and puts up fastest lap, his end of season total will be 36. For he must give up one of his two low scores (France or Italy) before he can add his Sebring score.

If Moss wins and gets fastest lap his total, having forfeited a point from either Holland or France, will be 33½. If Brabham comes home second his total will be 33 and Moss will be World Champion by half a point.

Why not work out what else *could* happen? Points are awarded as follows: 8, 6, 4, 3 and 2 for 1st, 2nd, 3rd, 4th and 5th places, and 1 point for fastest lap. Remember that the fastest lap can be shared by two or even three drivers.

In the event of Moss and Brabham scoring equal points over the season, the value of each of their five best placings will be taken into consideration. And do not overlook the fact that if Moss and Brabham score no points at Sebring, then Brooks can win the title by securing first place and fastest lap as well.

Whatever the result, it has been a fantastic season for Great Britain. The works car that Brabham has used, and the Rob Walker Cooper-Climax that Moss has driven, both come from Surbiton where Charles and John Cooper go from strength to strength and have been rewarded with the 1959 Manufacturer's Championship for both Formula 1 and Formula 2 cars. This is the first time that any manufacturer



The Rob Walker Cooper-Climax with which Stirling Moss hopes to wrest the World Title from Jack Brabham at the last minute.

has won both championships in the same year.

In the sports car field this country has also trounced the opposition, and David Brown's Aston Martins have given Great Britain the World Sports Car Championship for the first time ever.

The crowning glory will be a Champion of the World from the Empire for the second year running.

If ever there was an example of motor-racing improving the breed, it is the Aston Martin. Just prior to the Motor Show the new 3.7 litre D.B.4 Gran Turismo was announced, one of the most powerful production cars ever built. This superb example of British craftmanship, costing £4,534, including Purchase Tax, and with a triple carburettor, dual ignition power unit developing 302 brake horse power, offers a choice of five different axle ratios and a top speed ranging from 118 to 170 m.p.h., depending on which ratio is used.

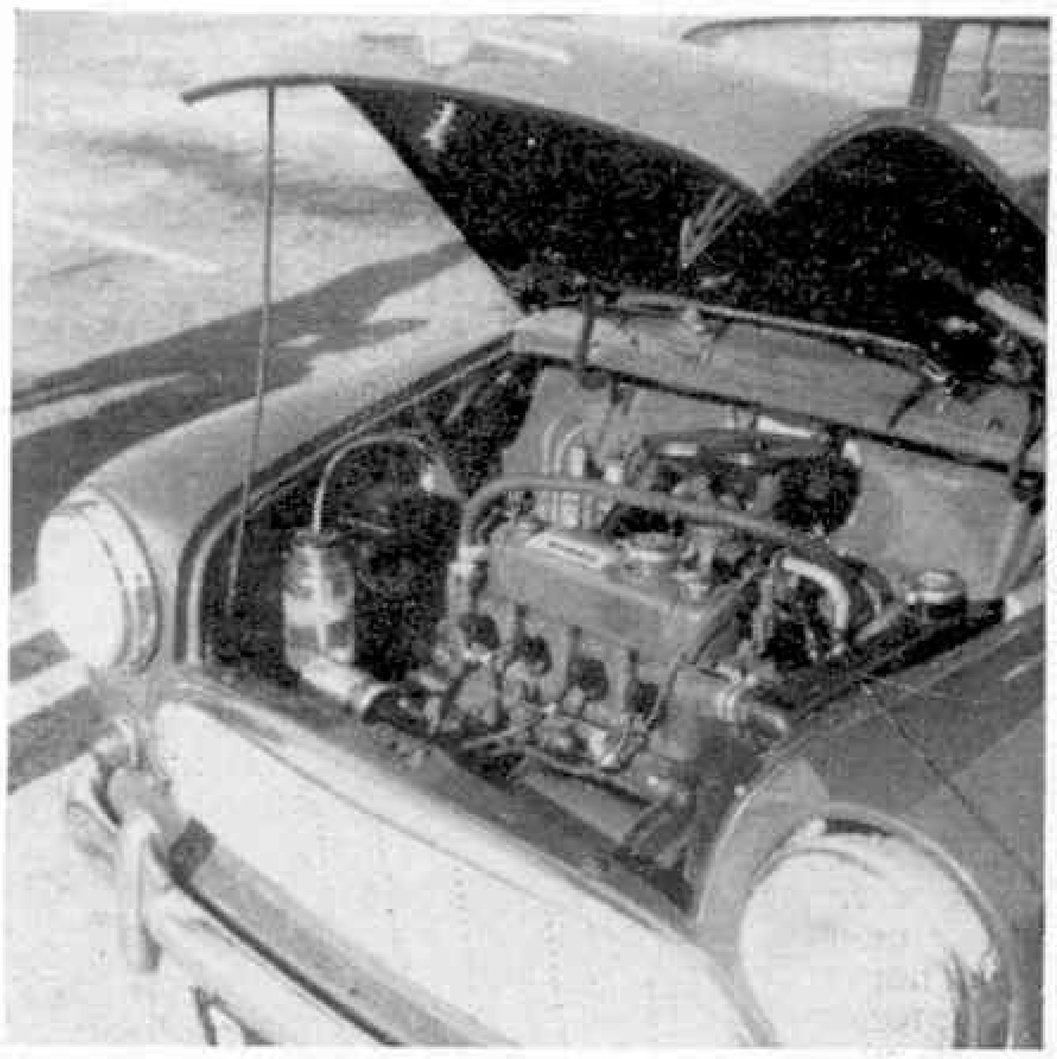
The D.B.4 G.T. was taken to the M.I.R.A. Test Track at Lindley, where acceleration and deceleration tests were carried out with the 3.77 to 1 rear axle. The object of the exercise was to find out how long it would take the Aston-Martin to reach 100 m.p.h. through first, second and third gears, and then how long it would take to decelerate from 100 m.p.h. to a stop.

With a driver and observer two tests were carried out on a level road surface of dry tarmac. In the first test the car reached 100 m.p.h. in 14.8 seconds, and in the second test it took 14.6 seconds. In each test the overall time to reach 100 m.p.h. and then brake to a halt was 20 seconds. Girling disc brakes on all four wheels with Ferodo anti-fade friction pads slowed the 24 cwt. car from 100 m.p.h. to a halt in less than six seconds. Speed with safety is indeed a hallmark of this famous marque.

I make no apologies for switching from Aston-Martin to Mini-Morris, for the latter—in its own way—is an equally astonishing motor car. I feel that B.M.C. should not have used the prefix "Mini", for the new Morris handles as well as some sports cars I have driven and can be hustled along just as hard. And this applies also to its twin, the Austin Seven.

I was loaned a Mini-Morris by B.M.C. on the occasion of the Gold Cup Meeting at Oulton Park, and with one passenger and the rear seat full of luggage we covered 175 miles from Hatch End, Middlesex to Tarporley, Cheshire, in exactly four hours. An average speed of 43.75 m.p.h. on a Saturday morning between 7 a.m. and 11 a.m. is good going for any car on this route, and absolutely no chances were taken, nor were other road users inconvenienced. In spite of hard driving and frequent use of third gear up to nearly 60 m.p.h., the petrol consumption was 43½ m.p.g.

From the point of view of handling properties, this low-priced economical family "Baby" can be driven like a thoroughbred sports car and loves it. The precise rack and pinion *(Continued on page 574)*



The power unit of the new B.M.C. babies is mounted transversely. This eliminates a propeller shaft to the rear wheels and allows the sump, gear-box and final drive to be lubricated by the same oil.



The Piaggio P.166, an interesting Italian pusher-type aircraft that can carry a pilot and seven passengers. Photograph by James H. Stevens.

Air News

By John W. R. Taylor

Businessman's Pusher

Spotting in Britain has become much more fun since the Government lifted its restrictions on the import of foreign-built aircraft. The ban was never very sensible, because our own industry produces nothing comparable with American light aircraft such as the Cessna 310, Piper Comanche and Piper Apache, with the result that Britons were unable to enjoy to the full the benefits of business flying.

However, not all the best business 'planes come from the other side of the Atlantic, and one of the most attractive is the Italian Piaggio P.166, illustrated above. It is very like the well-known P.136 amphibian, with the same 340 h.p. Lycoming GSO-480 engines, driving pusher propellers; but has a conventional landplane fuselage instead of a flying-boat hull.

The performance of the P.166 is first-class. At a loaded weight of 8,115 lb., it will carry a pilot and seven passengers for 1,020 miles at 175 m.p.h., and has a top speed of 224 m.p.h. A feature that makes it especially popular is that passengers can step straight into or out of the roomy cabin through a large door at the front, without any need for stairways or fear of walking into the propellers, which are behind the wing.

Of the first batch of four P.166s ordered by people in Britain, two have already been delivered to Sir Robert McAlpine and Sons and Lord Derby.

No More U.S. Interceptors

Cancellation of the contract for the North American F-108 Rapier two-seat fighter means that the United States has followed the lead of Britain and Canada, and has decided to entrust its future air defence entirely to guided missiles.

This move came as a tremendous surprise, for only a week or two earlier the U.S.A.F Chief of Staff, Gen. Thomas D. White, had said that long-range interceptors employing air-to-air missiles are needed to do a job which cannot be done by present-day fighters or the surface-to-air missiles now under development. This is easy to understand because the F-108, powered by two General Electric J93 turbojets of around 30,000 lb. thrust each, was intended to cruise at three times the speed of sound (2,000 m.p.h.) and attack enemy bombers while they were still 1,000 miles away from their targets. It will be a very long time before an interceptor missile can fly that far, or before it can be sent up to inspect an unidentified aircraft in peacetime and let it continue on its way if friendly.

Happenings at Handley Page

Two interesting items of news have come from Handley Page.

One of these is that the company has been chosen to carry out the first stage of the programme that will lead to Britain's first supersonic airliner during the mid-sixties, by building a small-scale wooden research aircraft to test the proposed shape of the airliner at speeds up to about 300 m.p.h. According to reports in the technical press, the Handley Page prototype will be a single-seater, with long narrow "paper dart" delta wings spanning about 20 ft. and a length of 40 ft. It will be powered by a Bristol Siddeley Viper turbojet and is expected to fly during next summer.

The second new Handley Page aircraft is in fact a conversion of an old one. The company is modifying about eight Hastings four-engined transports into bomber crew trainers for the R.A.F. The only major external change will be the addition of an enormous radome, 12 ft. long by 7 ft. wide, under the rear fuselage; but the cabin is being completely redesigned so that three V-bomber crews can be trained on each flight. The converted aircraft are designated Hastings T.Mk.5.

Fastest Woman Pilot

Mme. Jacqueline Auriol, the famous French woman pilot, flew at twice the speed of sound (about 1,350 m.p.h) on 26th August last, while testing a Dassault Mirage III jet fighter at Istres military airfield near Marseilles. She is the daughter-in-law of M. Vincent Auriol, a former President of France.

Silver City's New Ferryplanes

While other airlines have been busy re-equipping with jet and turboprop aircraft over the past few years, Silver City have continued to build up their cross-Channel vehicle ferry services with the safe and reliable piston-engined Bristol Freighter. Nobody has produced an aeroplane that meets their requirements for a replacement, so they have now decided to order a new fleet of ferryplanes tailored exactly to their needs. Of particular interest is that the aircraft will be a combined effort by Bristol Aircraft in England and the Breguet company in France. Few details are available

yet, except that it will be powered by two Rolls-Royce Dart turbo-props and will carry up to six cars and their occupants. Other features will include a large roomy cabin, rear loading ramp and fixed undercarriage.

Non-Flying Helicopter

A new German company with a big future is Bolkow-Entwicklungen of Ottobrunn, near Munich, which is manufacturing everything from gliders and light-planes to helicopters and anti-tank guided missiles.

One of its most unusual products is the Bo 102, a single-seat helicopter which is designed to do everything but fly. Except that the main rotor has only one counterbalanced blade, this machine looks little different from other light helicopters. But pupil pilots can sit in its cabin and practice take-offs, landings, hoverings, auto-rotative touch-downs, turns and flights in all directions without the slightest risk of accident, because they never really lose contact with the ground.



The German Bo 102 helicopter trainer is designed to "do everything but fly".

In the land version, the Bo 102 is mounted on a pivoting link arrangement, with a side seat for the instructor. Another version has a circular raft-like inflatable pontoon, with a spherical base, for training on water.

The Bo 102 is being used as a trainer by the West German armed forces, and has proved so successful that Bolkow have now taken one off its heavy base-structure and are testing it as a normal free-flying helicopter, under the designation of Bo 103. Powered by a 40 h.p. I.L.O. three-cylinder two-stroke engine, it weighs only 965 lb. fully loaded and will fly for four hours at 62 m.p.h.

London to New York in Two Hours

With companies in Britain and America already producing design studies for supersonic airliners, it is interesting to speculate on what it will be like to fly across the Atlantic in ten years' time. One of the most reliable guides has been given by Convair, whose latest ideas are depicted in the lower illustration on this page.

Convair believe that the ideal shape for a 2,000 m.p.h. airliner will be a tail-first delta-wing design with the turbojet engines mounted under the wings. It will have no windows in the passenger cabin, mainly because the absence of cut-outs will give a stronger, safer structure, but also because passengers would see little of the ground from the 60,000–80,000 ft. cruising height, where the glaring sun would be painful for their eyes. Instead, each passenger will have an individual television screen, giving for the first time a clear view vertically downward and even "over-the-shoulder" of the pilot as the aircraft comes in to land.

To save time and fuel, a supersonic airliner will need to climb and descend steeply from its cruising altitudes. As a result, Convair suggest putting the passengers in pivoting seats that would remain upright no matter how steep the angle of the aircraft's deck might be.

It sounds a little frightening, but I suppose we should get used to it all in time, and the idea of flying from London to New York in two hours is certainly attractive.

What is more, travel will be safer as well as faster if supersonic speed can be combined with jet-lift vertical take-off.



An artist's impression of the airliner of the 1970s. It will be able to fly at more than three times the speed of sound.

Orange Juice for a Sheikh

Not long ago a giant DC-6A airliner belonging to Eagle Aviation flew from Blackbushe Airport with a cargo of 11 tons of concentrated orange squash compound. Anxiously awaiting its arrival in far-off Kuwait was His Excellency Sheikh Duej al Sabbah, owner of a bottling factory where the compound was converted speedily into orange squash and orangeade for sale throughout the Middle East.

If you want to know how much "fizzy pop" can be made from 11 tons of orange juice, the answer is over a million bottles.



The portable "building" seen on the left is just blown up to erect it.

Held up by Air

New Type of Portable Building

A "BUILDING" that can be put up on an unprepared site in a matter of minutes is one of the latest advances in portable housing. It is the Gourock Airhouse, two views of which appear on this page. It can be put to many uses, storage for instance, large-scale camping, or as a sports marquee, and it has the great advantage that there are no supporting columns within it to take up space or hinder movements.

The outer cover of this strange type of structure, which is of specially-treated nylon or Terylene, is tough and durable, although light in weight, and gives complete protection from the weather. In ordinary daylight, it is claimed, the light inside is as good as that outside and in sunny weather the light level actually exceeds that outside. The cover material can be fireproofed without affecting its other qualities.

The "framework" of the building consists of two ends, which are half-hemispheres, and a number of straight sections between them to give the length desired. When it is being erected, the necessary sections are laid out on the site and laced together with the base ring secured by pegs. Then a fan unit, blowing a large volume of low-pressure air under the fabric, inflates the house rapidly.

The fan is kept running as long as the Airhouse is in use. This holds up the structure and provides fresh air, so that there is no fug or stuffiness, and the cost is only about a penny per hour. The difference between the internal pressure and that of the atmosphere is only about half an inch Water Gauge. Doorways can be provided to suit the particular purpose for which the Airhouse is being used.

For travel, an Airhouse 100 feet long, 40 feet wide and 20 feet high packs into three canvas valises, the fans, porch, etc. being additional.

One further point will interest many readers—the Airhouse normally carries no rates!

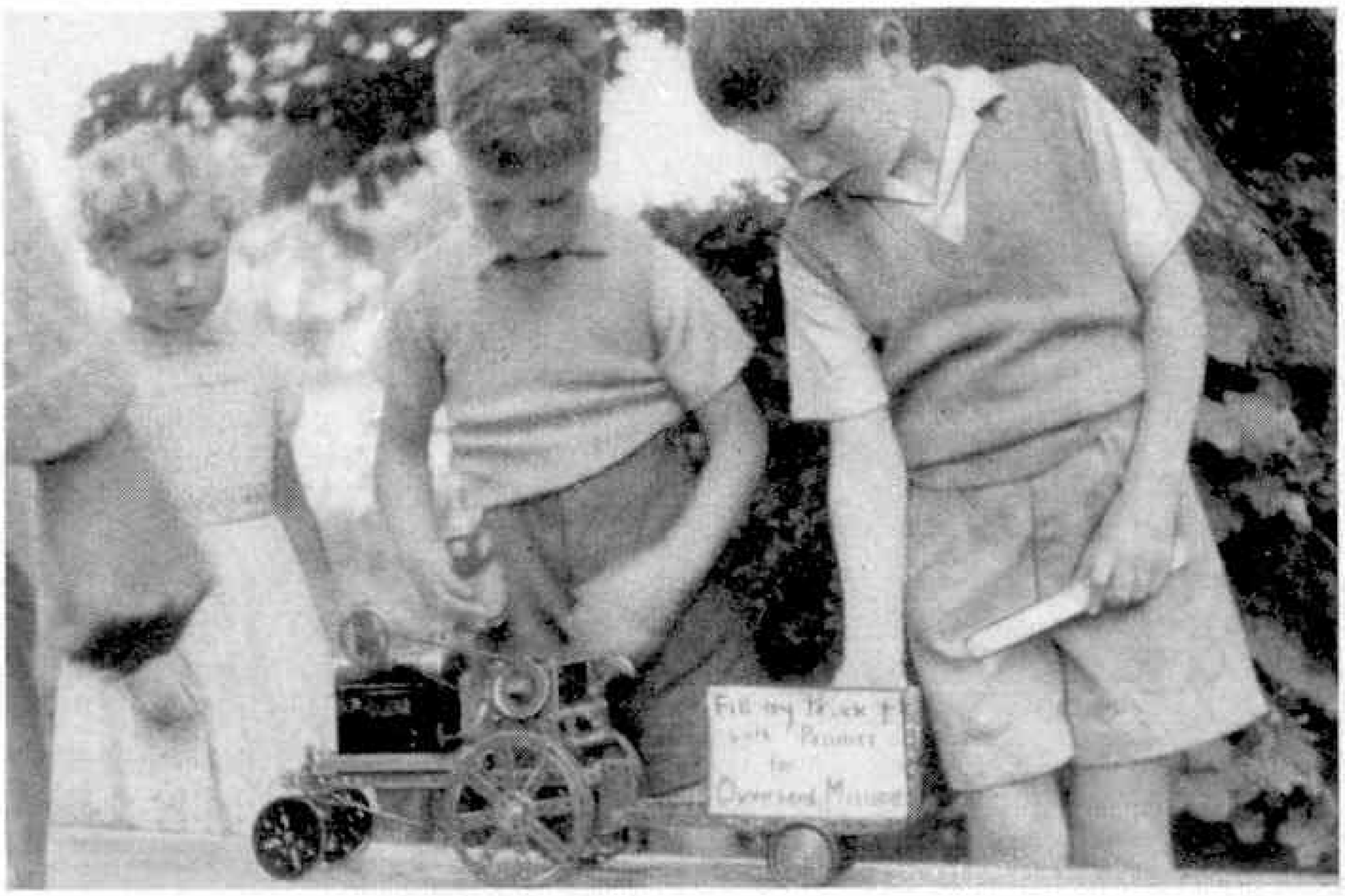


Mid-air agility in the Airhouse.

MECCANO MAGAZINE

Junior Section

MICHAEL West, who lives in Morpeth, Northumberland, had a bright idea a short time ago when he heard that a Garden Fête was to be held at his father's church. This was that he would build a Meccano traction engine, fit it with a small toy steam engine that he possessed, and attach to it a truck in which he could collect pennies, from visitors to the Fête, in aid of a missionary society.



How successful he was in carrying out this idea is shown by the upper picture on this page. The model ran perfectly for nearly two hours, forward and backward, and by the end of the Fête his truck was full of coppers. Apart from the steam engine, it was built entirely of standard Meccano parts. Michael reports that his father had a hand in building it, but that is not surprising, as he is only 7 years old.

At the Congleton Boys Secondary Modern School Open Day in June last, the Science Room was one of the busiest in the display, and no wonder, for Horace was walking up and down on one of the tables. You can see Horace in the accompanying picture. He is nearly 3 ft. tall, of standard Meccano design apart from certain modifications.



The constructor of this rather unexpected visitor to the Open Day was Michael Bradbury. It is said that Horace enjoyed walking very much, his eyes flashing with enthusiasm whenever his electric motor set him on the move!

"Spanner's" Special Section for Juniors

Easy Model-Building

Caddie Car

The simple little model shown in Fig. 1 represents a type of caddie car that is often seen on golf courses in this country. The first part of it to be constructed is the handle 1, which consists of two 5½" Strips overlapped three holes and bolted together by the bolt 2. The bolt 2 holds also two Fishplates, each of which in turn has an Angle Bracket bolted to its free end. These are placed in that position to keep the golf bag in place.

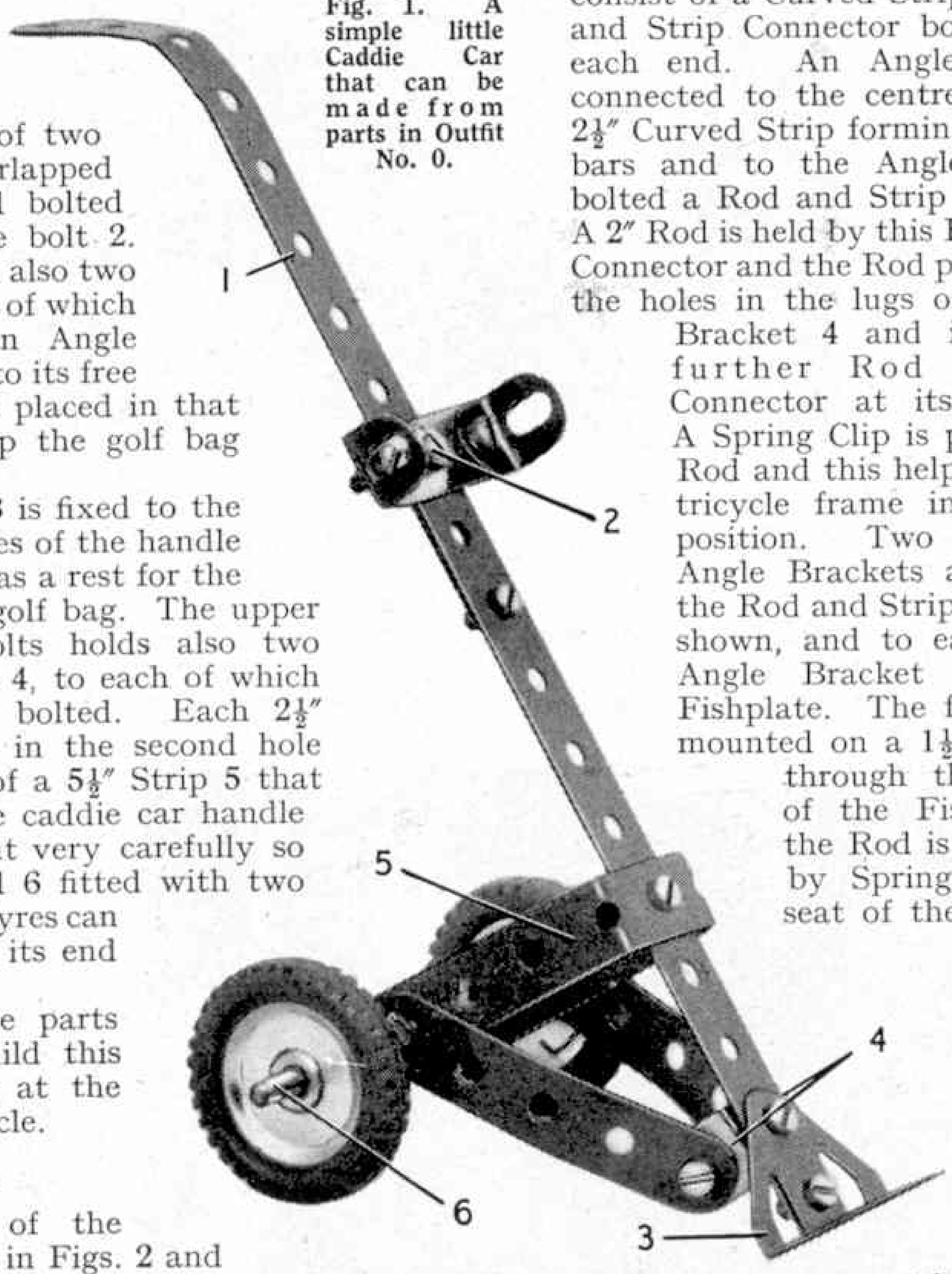


Fig. 1. A simple little Caddie Car that can be made from parts in Outfit No. 0.

A Trunnion 3 is fixed to the bottom two holes of the handle and this serves as a rest for the bottom of the golf bag. The upper of the two bolts holds also two Angle Brackets 4, to each of which a 2½" Strip is bolted. Each 2½" Strip is bolted in the second hole on either side of a 5½" Strip 5 that is bolted to the caddie car handle and is then bent very carefully so that a 3½" Rod 6 fitted with two 1" Pulleys and Tyres can be mounted in its end holes.

A list of the parts required to build this model appears at the end of this article.

Tricycle

The frame of the Tricycle shown in Figs. 2 and 3 consists of two 2½" Strips 1 bolted at one end to the lugs of a Double Bracket 2, which is connected by a bolt to the centre hole of a 2½" Strip 3. Two 2½" Curved Stepped Strips are bolted to the other ends of the 2½" Strips and a Double Bracket is held at its lugs by the same bolts as those that serve to hold the 2½" Strips and the 2½" Curved Strips together. At the top of the 2½" Curved Strips a third Double Bracket is fixed, and it is then bolted to a fourth Double Bracket 4.

The handlebars of the tricycle consist of a Curved Strip with a Rod and Strip Connector bolted to it at each end. An Angle Bracket is connected to the centre hole of the 2½" Curved Strip forming the handlebars and to the Angle Bracket is bolted a Rod and Strip Connector 5. A 2" Rod is held by this Rod and Strip Connector and the Rod passes through the holes in the lugs of the Double Bracket 4 and is held in a further Rod and Strip Connector at its lower end. A Spring Clip is placed on the Rod and this helps to keep the tricycle frame in the correct position. Two ½" Reversed Angle Brackets are bolted to the Rod and Strip Connector as shown, and to each Reversed Angle Bracket is bolted a Fishplate. The front wheel is mounted on a 1½" Rod passed through the free holes of the Fishplates, and the Rod is kept in place by Spring Clips. The seat of the tricycle is a Flat Trunnion that is bolted to a lug of a 1½" × ½" Double Angle Strip. This is connected at its other lug to an Angle Bracket 6 bolted to one of the 2½" Strips 1.

An Angle Bracket is bolted to each end of the 2½" Strip 3 and is connected to a Fishplate. A 5½" Rod, which is the rear axle of the tricycle, passes through the

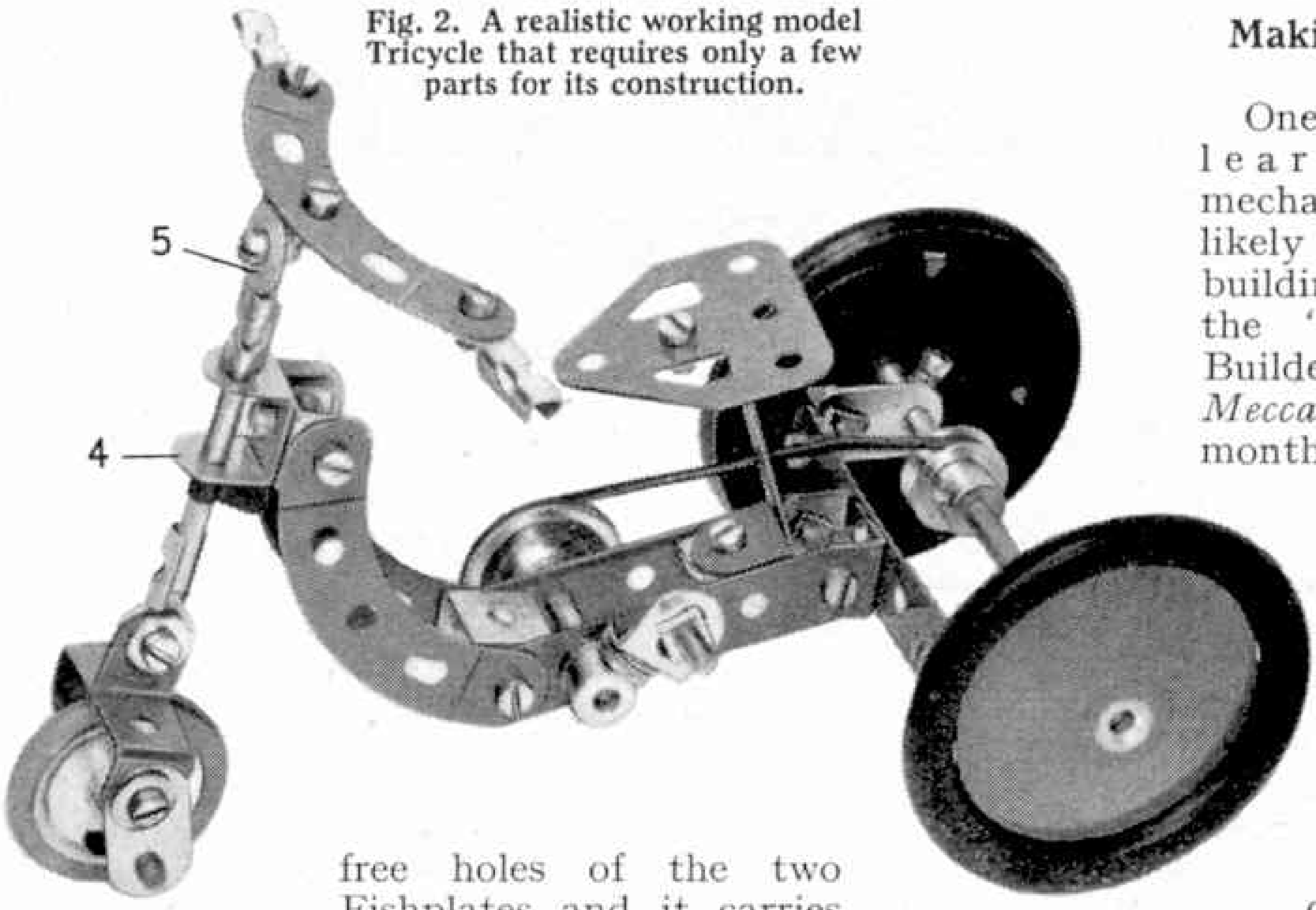


Fig. 2. A realistic working model Tricycle that requires only a few parts for its construction.

free holes of the two Fishplates and it carries two Road Wheels and a ½" Pulley 7. A 1" Pulley is mounted on a 1½" Rod 8 and an Angle Bracket is held firmly by a bolt screwed into a threaded hole in its boss. Washers are placed between the boss of the Pulley and the Angle Bracket. At its other end the Rod is held in position by a Collar with an Angle Bracket fixed to it in a similar manner. A ⅜" Bolt is fixed in the free slotted hole of each Angle Bracket. These form the pedals of the tricycle.

When the pedals are turned the 1" Pulley held on Rod 8 drives the ½" Pulley and the model travels along in the same way as a real tricycle.

Parts required to build the Tricycle: 3 of No. 5; 4 of No. 10; 4 of No. 11; 6 of No. 12; 1 of No. 16; 1 of No. 17; 2 of No. 18a; 2 of No. 22; 1 of No. 23a; 3 of No. 35; 24 of No. 37a; 24 of No. 37b; 16 of No. 38; 1 of No. 48; 1 of No. 59; 3 of No. 90a; 2 of No. 111c; 2 of No. 125; 1 of No. 126a; 1 of No. 155; 1 of No. 186a; 2 of No. 187; 4 of No. 212.

Parts required to build the Caddie Car: 3 of No. 2; 2 of No. 5; 2 of No. 10; 4 of No. 12; 1 of No. 16; 2 of No. 22; 11 of No. 37a; 11 of No. 37b; 1 of No. 126; 2 of No. 142c.

"SPANNER'S" ADVICE TO JUNIORS

Make sure you send in an entry for the November Model-Building Competition announced on page 562. No matter what your age or the size of your Outfit may be, you will have a good chance to win a fine prize.

Making Progress in the Meccano Hobby

One of the best ways of learning all about mechanisms that you are likely to require in model-building is to read carefully the "Among the Model-Builders" pages in the *Meccano Magazine* each month. In addition to this valuable source of information, however, there is now available a *"Meccano Book of Mechanisms"*. This Book is made up of beautifully clear illustrations and details of a number of useful mechanisms of the more simple types, together with descriptions of their uses. The mechanisms described are built entirely from Meccano parts, and can be adapted to make them suitable for fitting into appropriate models of various kinds. Every young model-builder will be well advised to obtain a copy of the Book without delay.

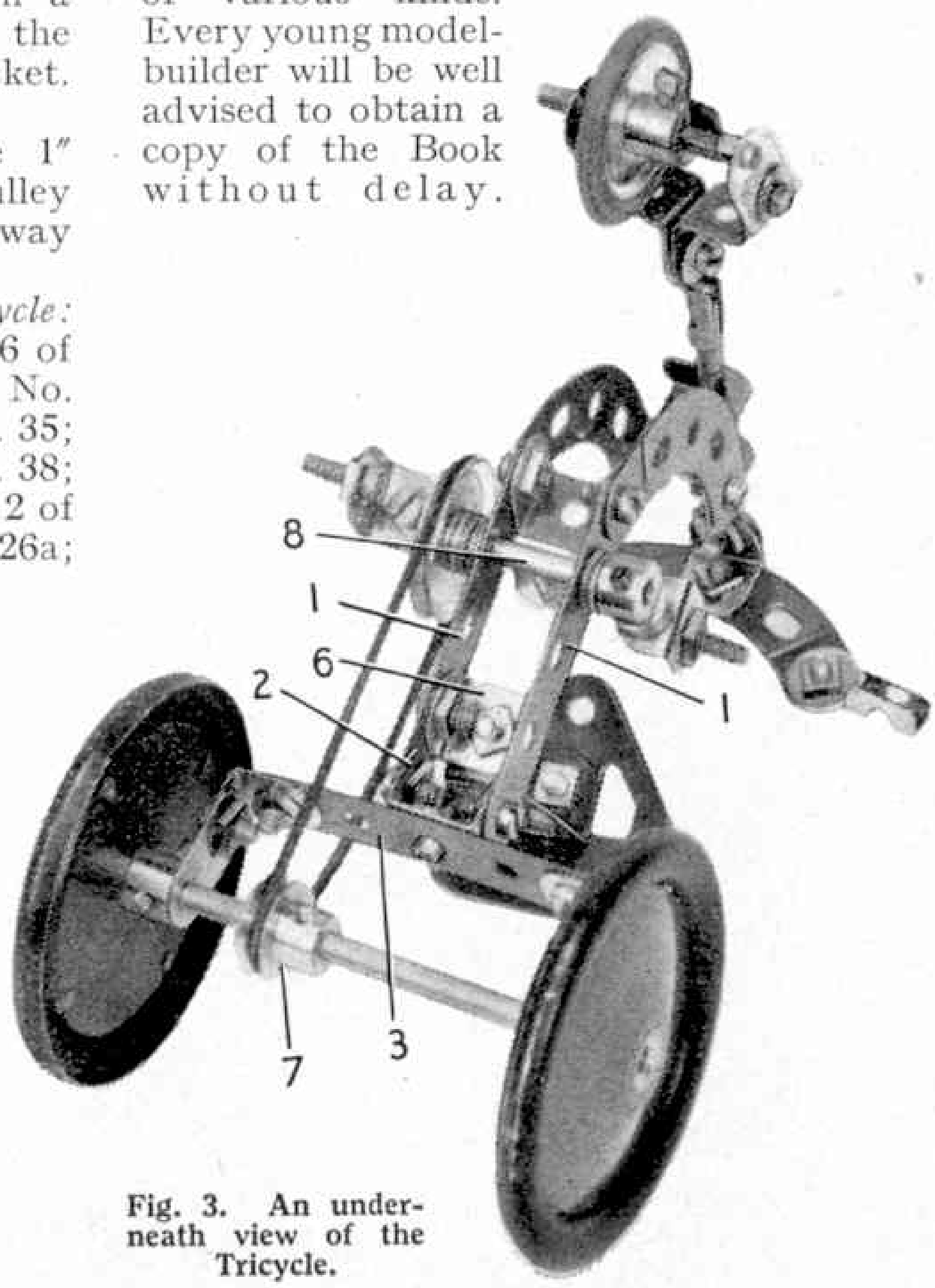


Fig. 3. An underneath view of the Tricycle.

DINKY TOYS NEWS

By THE TOYMAN

THE membership of the Dinky Toys Club now includes thousands of enthusiastic collectors in almost every civilised country of the world, and new applications to join our ranks pour into the Club Offices each day.

This wonderful progress is very pleasing in view of the comparatively short time that the Club has been in existence. The other day, when looking through my files, I came across a photograph of one of the earliest members of the Club, young David Payne, who lives at Cowes, Isle of Wight. David was only seven years of age when he sent in his application, and he is seen with part of his collection in the picture at the bottom of this page. It will be agreed that he has quite an assortment of models, no doubt those that he considers to be the best!

I think it is a good idea for young collectors to assemble a mixed collection, rather than to specialise in a few types such as agricultural or army vehicles, as interesting layouts can only be built up from a varied assortment. Specialisation can come later, when more intensive knowledge of the subjects concerned has been acquired.

Now that the long dark Winter evenings are with us again, it is pleasant to think back to the hot Summer days of this wonderful year, when we were able to build up our layouts out of doors. The picture at the top of page 549 shows such a layout constructed by another David, who lives at East Wittering, Sussex. This is David Tucker, and he also is the lucky possessor of a fine collection of Dinky Toys. In the picture you can see some of them arranged on a road that has realistic curves and markings. The bridge seen on the right in the background helps to build up the realism of the scene.

Although this layout is quite a large one, it is easily filled by David's collection. Attractive features are provided by the farming activities taking place in the centre of the layout, and the caravan folk camping in a field. David, seen in the picture, looks justifiably proud of his well-ordered road, on which very heavy traffic is flowing so smoothly.

Farming scenes are particularly suitable for outdoor layouts, but quite realistic table-top layouts can be constructed. So, although for a time those of us who live in Great Britain are not likely to have our layouts in the garden, it is not necessary to wait until next Summer to have some fun "down on the farm!" Far from it. Now is the time to see how inventive we can be in making our indoor layouts realistic.



David Payne, Cowes, displays a selection of his Dinky Toys. David was one of the earliest members of the Club.



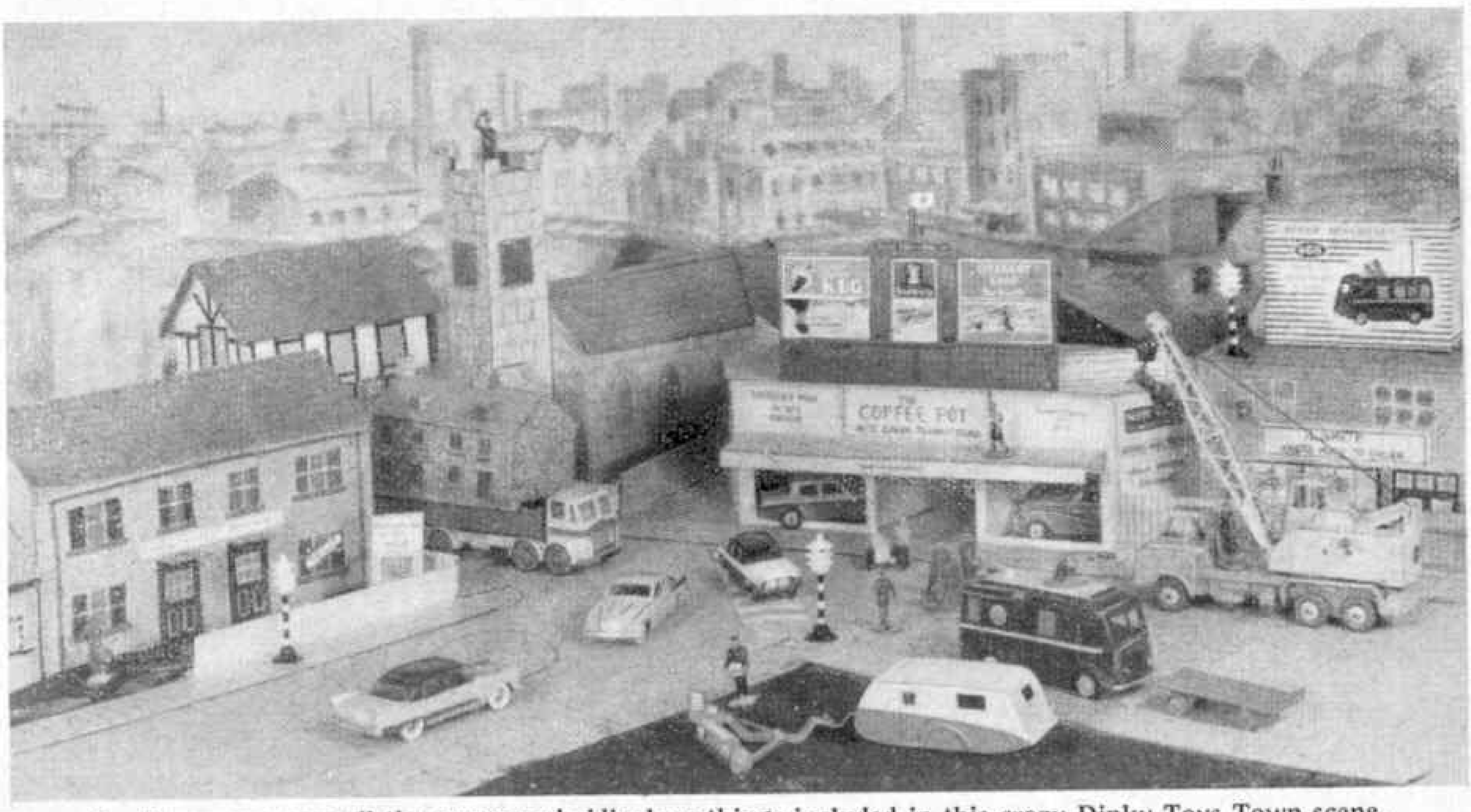
Seen with his layout in a Sussex garden is young David Tucker, who lives at East Wittering.

"Taxi!" Often we hear this cry in the streets of many large towns! A close-up photograph of part of a layout I made recently shows the Austin Taxi, Dublo Dinky Toys No. 067, answering a call. The photograph is reproduced at the foot of page 550, and the Taxi is shown leaving the kerbside after having picked up a "fare" outside the Hotel Royal. Here we see a good example of a single building used to good effect as the centrepiece of a realistic scene. I feel that I must confess that only the front of a building has been used! But the result is good, and sometime I must complete the structure for use in another layout.

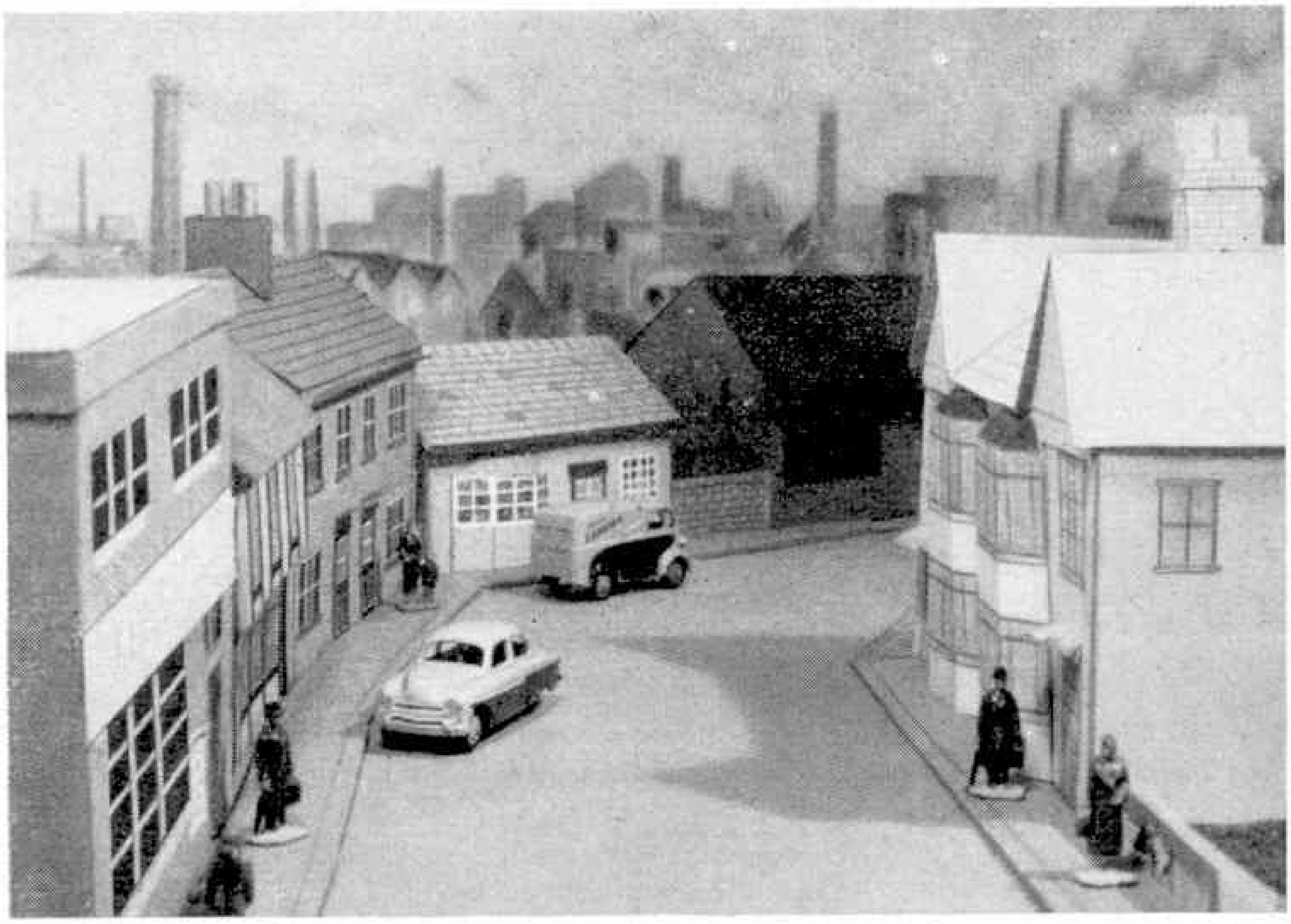
The other vehicle seen parked outside the Hotel in this picture is, of course, the Ford Prefect, Dublo Dinky Toys No. 061. When using Dublo Dinky Toys in a layout, care must be taken over scale, as these vehicles are approximately to half the scale of standard Dinky Toys. If the buildings used are too large, they will tend to overpower the miniatures.

I know that many Club members make a practice of taking "snaps" of their layouts, and I would like to point out that special care must be taken over detail if realism is to be achieved in a close-up photograph of this kind. The Dublo Dinky Toys themselves are full of detail, but the buildings and other accessories must be very neatly constructed and assembled if a really good effect is to be obtained.

Readers may remember that in the Dinky News pages of the September issue of the Magazine I included a picture of a Dinky Toys race track scene in which so many ridiculous errors appeared that the reader might have been excused if he had thought that the layout was the work of a crazy collector! Actually, the mistakes were made deliberately, with the idea of providing



See if you can spot all the errors and ridiculous things included in this crazy Dinky Toys Town scene.



An attractive suburban scene, consisting of a few cardboard buildings arranged against a painted background.

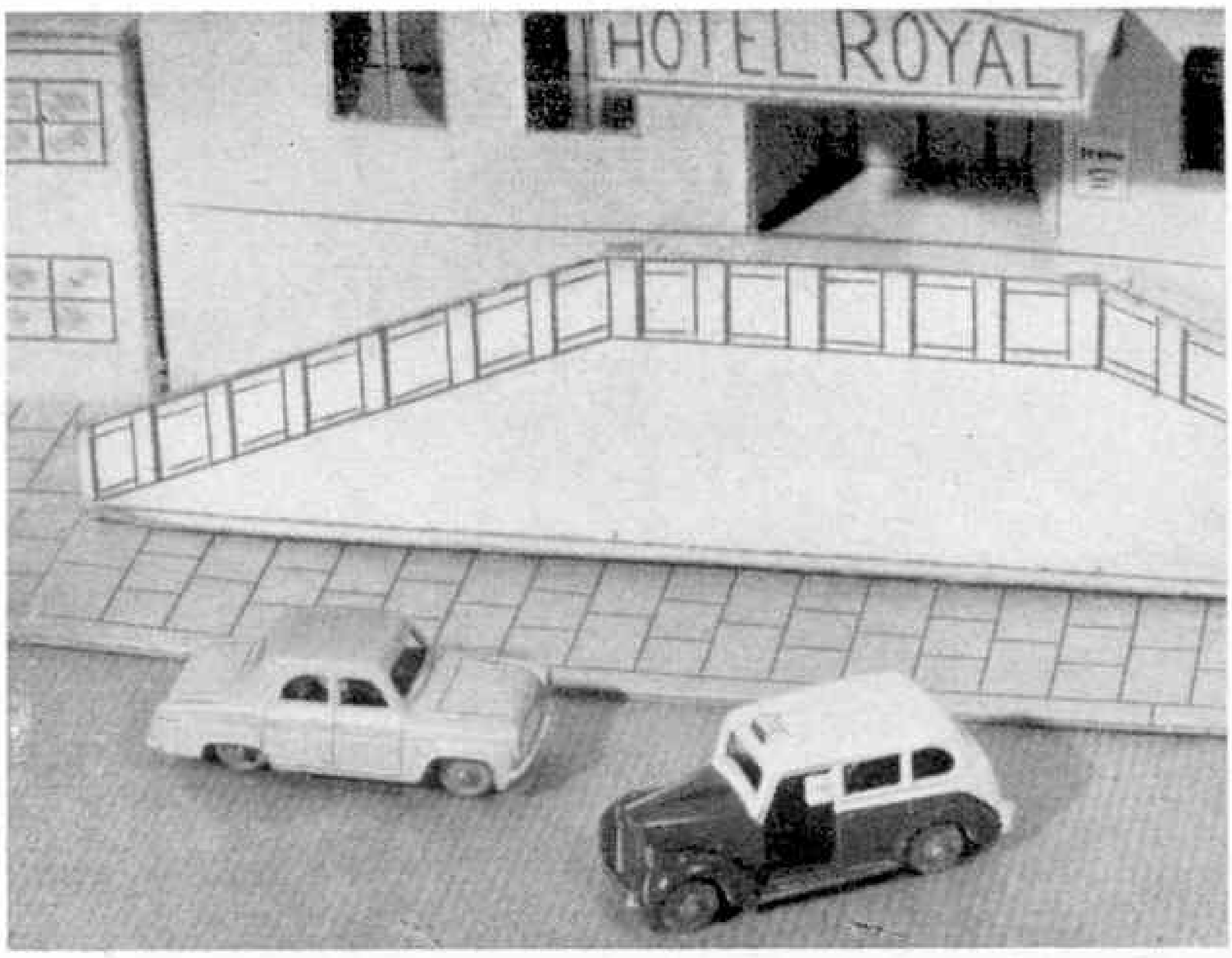
readers with an amusing half-hour or so in trying to spot as many of them as possible. I invited readers to list all the errors they could find in the picture and then send their lists to me. I also promised to make small awards to the senders of the most complete lists I received before the end of September last.

The puzzle picture certainly entertained readers, for so many sent in entries that it has been quite a task to sort and check them. This has now been completed and I am able to record that awards of 5/- have been made to each of the following: G. Fender, Edinburgh 6; M. J. Holliday, Northampton; A. Horn, Grimsby; A. Pyshorn, Middle Drove, Cambs.; D. Nelson, Tadworth, Surrey; and J. R. F. Young, Croydon.

I am sure that readers will give a warm welcome to another opportunity to "Spot the Errors". I suggest therefore that you see what you can do with the Dinky Toys town scene at the bottom of page 549. A quick glance will be quite sufficient to reveal some of the crazy things to be seen in this picture, but you will have to study it much more carefully to spot all of them. At least, I hope so! But go ahead and see what you can find.

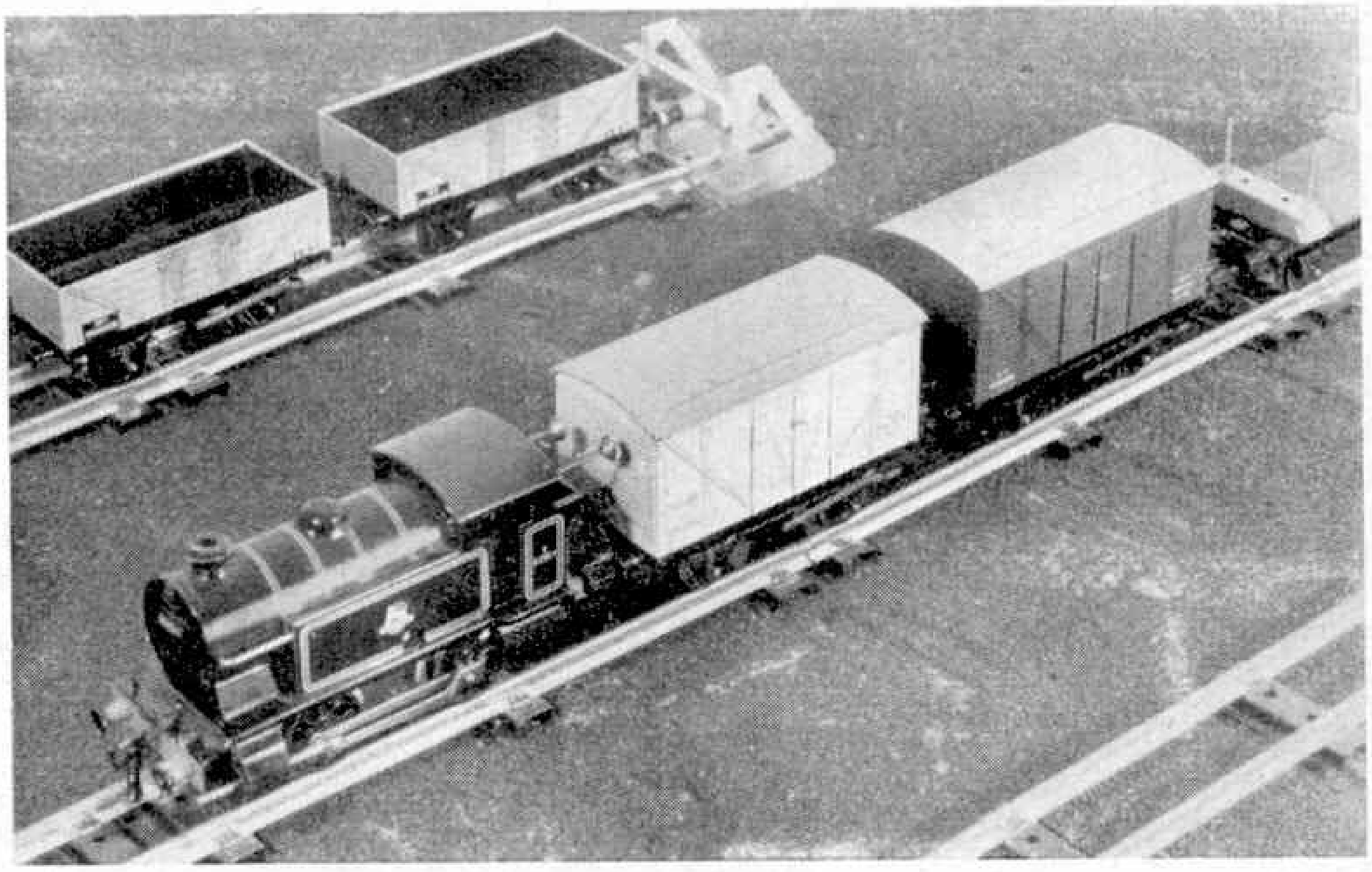
Make a list of all the things you consider to be wrong in the picture and then send your list to *"Spot the Errors" Contest No. 2, Meccano Magazine, Binns Road, Liverpool 13.* Please make sure that you post your list in time to reach Liverpool before the 31st December. I will again award a number of small cash prizes for the best and most comprehensive lists received.

By the way, "Spot the Errors" will provide splendid fun at your Christmas party. So make sure you include the contest in your party arrangements.



"Taxi!" Dublo Dinky Toys No. 067, Austin Taxi, seen leaving the Hotel Royal, where it has picked up a "fare". The other car in the picture is the Ford Prefect, Dublo Dinky Toys. No. 061.

"Tommy Dodd" Writes About



Train Services "Behind the Scenes"

A HORNBY layout in the garden, in the December issue? You may be surprised to see the picture of one on the following page, but don't forget that out-of-doors is a good place for photography and that is why Keith Rayner, of Halstead, seized the opportunity our splendid summer gave him of taking one or two photographs when his railway was out on the lawn.

The picture I have chosen from the several prints that Keith Rayner sent me was selected because it illustrates a point that I mentioned in connection with the outdoor layout dealt with last month, in which a turntable served as a traverser as well as for its normal purpose. Here we have an illustration of this, for the Hornby No. 2 Turntable is connected to the platform line and to a loop, as well as to several other radiating tracks on which engines can stand.

This railway is the *Stoke Manby and Claremont Junction Branch Line*. It began with a Hornby Train Set, which included the M3 Tank Locomotive, that is the corresponding engine to the one known nowadays as the No. 40 Tank. Gradually the layout grew, for every birthday and Christmas saw something added.

In the picture above vans with perishable traffic are next to the engine. They are respectively a Hornby No. 50 Refrigerator Van and a No. 50 Goods Van.

After experience with various layouts—changes, of course, are easily made with Hornby tinplate rails—the owner of the system, which is a portable one, decided to adopt a more or less fixed plan and this is the scheme that is followed now. It allows properly organised train services to be run, with the loads and make-up of the passenger trains arranged on a regular basis, this being the ideal condition for clockwork locomotive working.

Rather like the layout referred to last month, the system is laid on the non-continuous or "there and back" scheme, which permits the train services to be run on a realistic basis, as definite journeys from point to point are made.

Timetable working is not indulged in, but train working is arranged according to a definite programme in "cycles" as it were. What to many may seem surprising is that the branch line represented by the layout does not really join a main line. The latter indeed exists in imagination only, behind the scenes, as it were, but the thought of it helps to give the right air to operations. With this in mind, and a regular service of trains on the branch to

and from the station which is always thought of as a junction, each train pauses for a little while on the reverse loop.

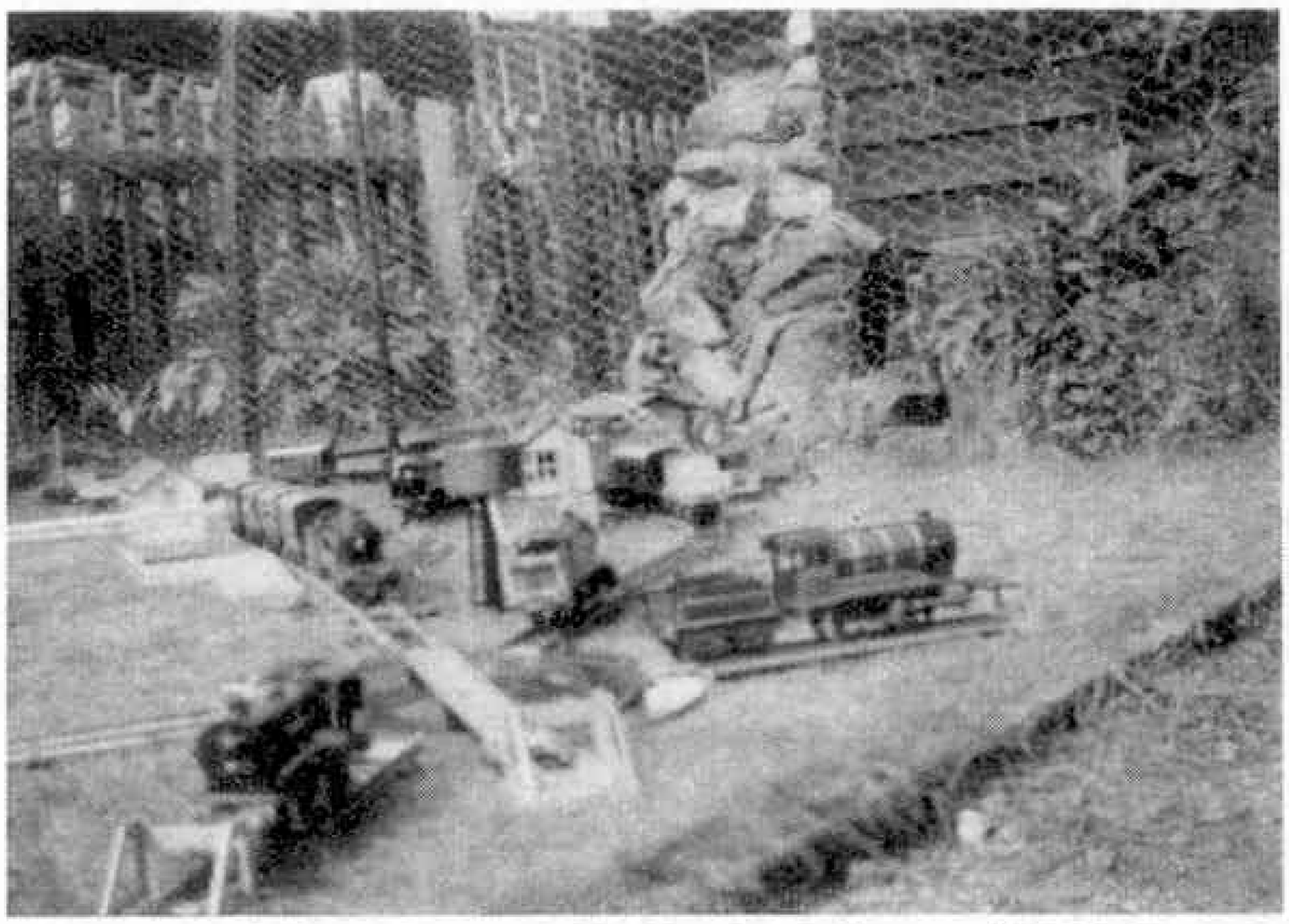
During this time the train changes its identity as well as its direction, and when it moves again it becomes a service from the imaginary junction to the branch line station.

There are plenty of vehicles for the various kinds of traffic, and in acquiring the different items of rolling stock special regard has been paid to the needs of the developing village known as *Claremont*. There is perishable traffic too, and good use therefore is found for the various vans of the Hornby system, of the type that you see in the other two illustrations on these pages.

In addition to locomotives and rolling stock of current type there are various older models from the Hornby range of earlier items, including a snow plough. This is an impressive piece of equipment, but it is for show only, as you can well imagine.

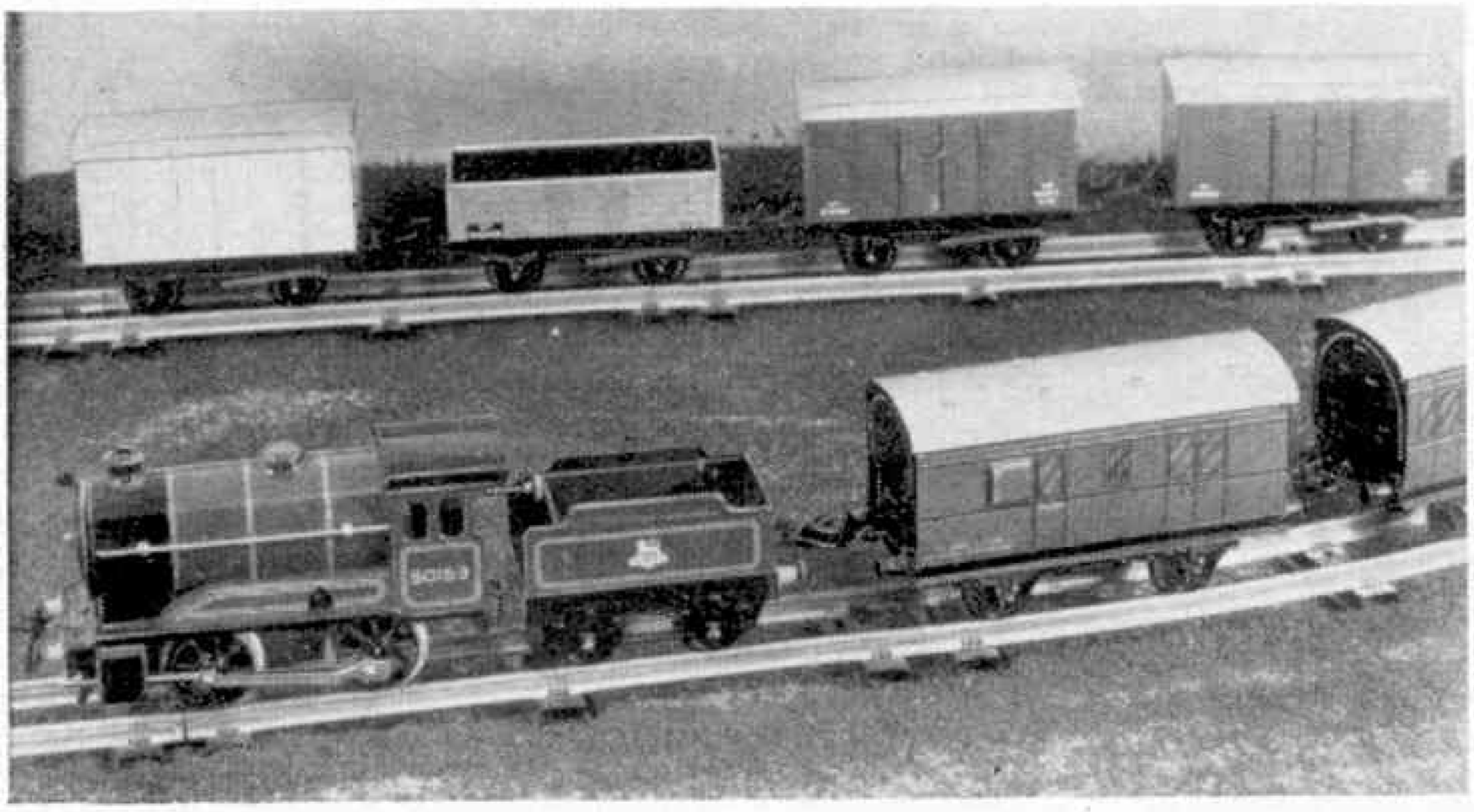
It is inevitable that a railway that is built up over the course of years includes some fairly old equipment, some items dating from the beginning of the line, and others perhaps acquired from previous owners. Many of you who read this will already have a Hornby railway and many more will be hoping to start one within the next few weeks and to build it up by degrees, to form a railway perhaps as enjoyable as the one you have just been reading about.

When expanding in this way you may sometimes wonder whether any particular engine or item of rolling stock you have in mind will be a suitable addition to the equipment you already have. If you are in any doubt on points of this kind, write to me, explaining just what you want to do on your railway, and I will endeavour to help you. Here in the *M.M.* I talk about many things concerning Hornby Gauge 0 train equipment of current types, but there is no space to go into every why and wherefore, as the railways of different enthusiasts, and their ideas for running them, vary widely. That is why it is so interesting to read about them and to help deal with any special problem that may arise. What about yours?



"Stoke Manby" terminus on the Hornby Railway of Keith Rayner, Halstead. Various tracks radiate from the turntable, which thus acts as a traverser.

Finally, a word or two to beginners. Do read the instructions in your train set. They are there to help you. What they say about the track, and the oiling and management of the engine does matter.



A stopping passenger train is here hauled by a No. 51 locomotive. Goods vehicles stand in the siding beyond.

Of General Interest



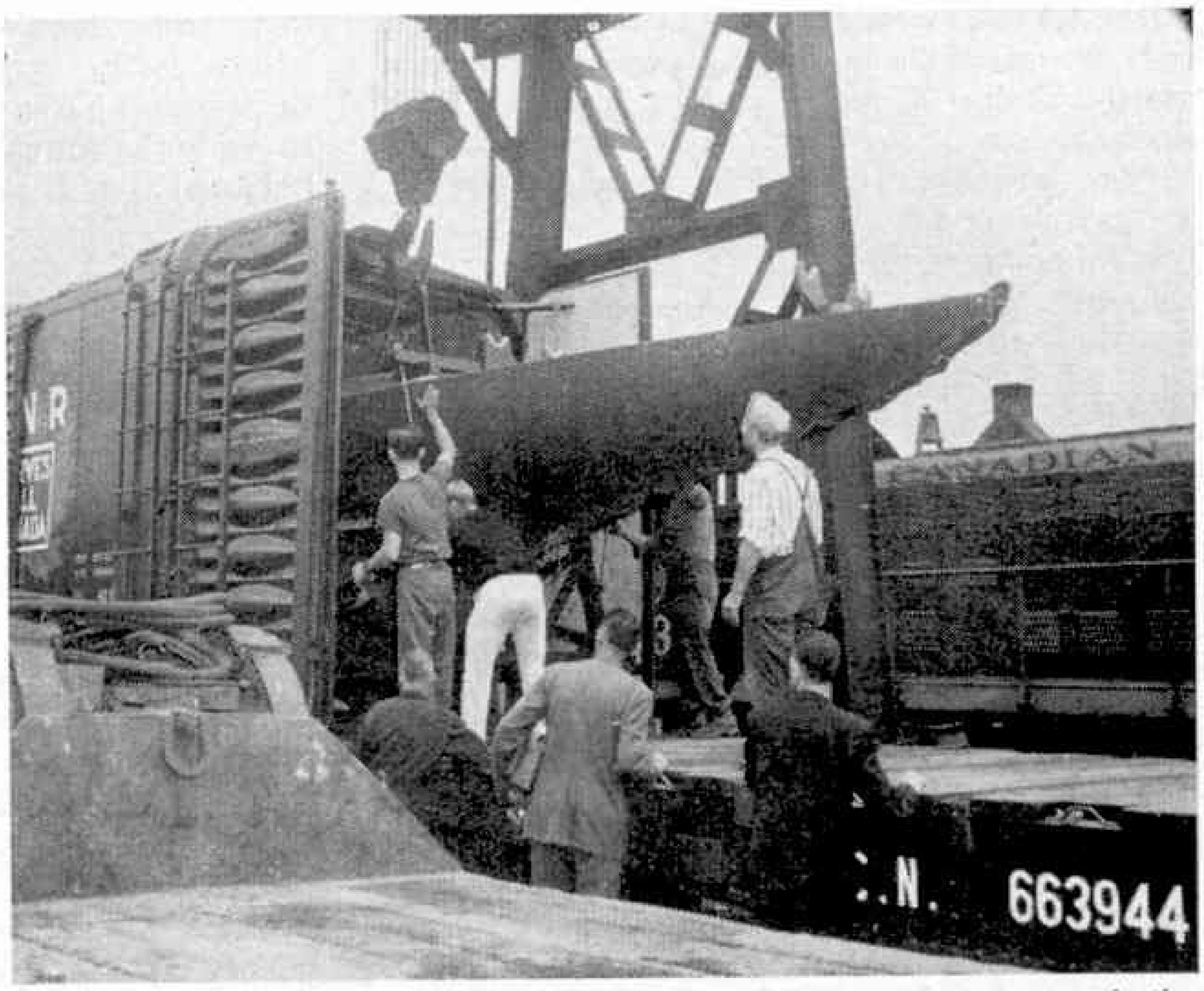
A Bedford 4 x 4 lorry and a Dyson Trailer loaded with oil pipes on Romney Marsh. Both lorry and trailer are fitted with low-pressure Terra-Tyres. Shell photograph.

THE picture above shows a Bedford 4 x 4 lorry and a Dyson 4-wheel trailer, but the chief things to note in it are the tyres. These are revolutionary. They are barrel-shaped, and are designed for crossing marshy ground of a kind that previously could not be negotiated except by expensive tracked vehicles.

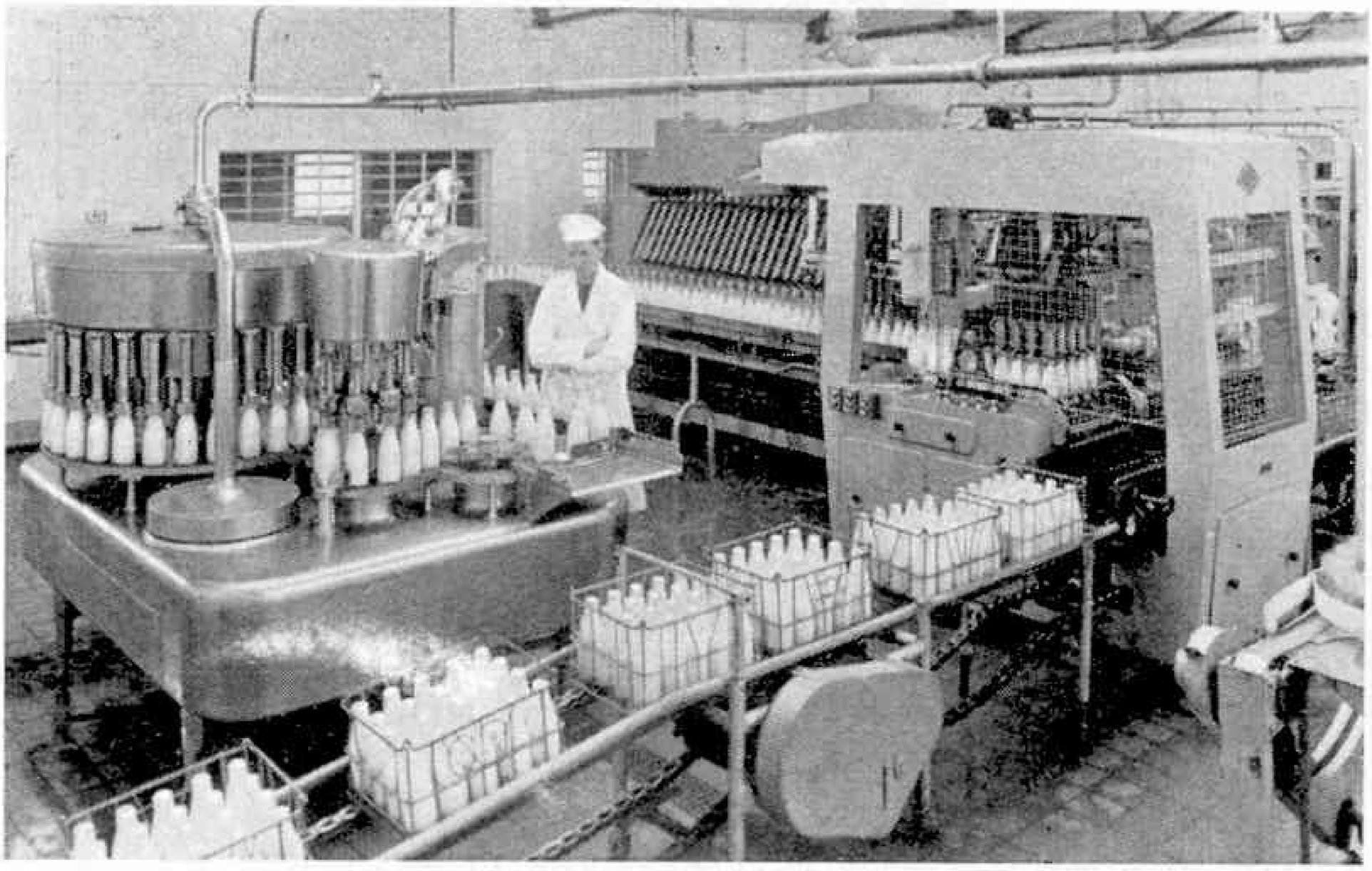
The new tyre is the Terra-Tyre developed by the Goodyear Tyre and Rubber Company. It works on low pressure, normally between 5 and 15 pounds per square inch, and is so large that its ground pressure is less than that of the foot of a man.

The tyres seen in the picture are 48 in. in diameter, and 24 in. wide. The vehicle is one of six Terra-Tyred oilfield vehicles for use by Shell Condor S.A. next year in soft ground in Colombia, carrying heavy equipment in territory previously only approachable by helicopter, or by special costly tracked vehicles. The photograph was taken when the lorry was hauling a trailer loaded with pipes weighing 10,000 lb. over a grass-covered swamp during a demonstration on Romney Marsh. Their speed on soft ground is 20 m.p.h.

Incidentally what are claimed to be the largest tyres made in Great Britain are Goodyears fitted to a Euclid power scraper that stands nearly 8 ft. high. The total weight they carry is just over 72 tons.



A yacht travels by rail in Canada. She is "Sceptre", the vessel that made the most recent attempt to gain the America's Cup. C.N.R. photograph.



About a Number of Things

Milk, Butter, Cheese and Stainless Steel

By the Editor

JUST one turn of the tap and water comes out. Just press a switch and light comes on. Simple operations. No thought required. Open the door and the milk is outside. Why not? Surely there is nothing easier to produce than a bottle of milk. Just hold a bottle under a cow. . . .

Yes, quite simple. The idea is that of a comparatively unknown writer named Ybsur, who appears to be some sort of authority on milk, but it is unthinkable, in these days of stainless steel.

Stainless steel is a very interesting product. Its discovery followed an observation by a famous Sheffield metallurgist named Brearley, who happened to notice that some of the bits of steel in a pile of scrap from melting experiments that had been left out in the open for some time had not rusted. He pulled out some of the unrusted scrap to see what it was made of, and then found that this particular steel contained a large proportion of chromium, a much rarer metal than iron. The result was that before long a range of stainless steels came into existence.

Now, why have I dragged stainless steel into this story, which began with milk? There is in fact an intimate connection between the two, for stainless steel is used to an enormous extent in the milk industry because it will not rust, and is resistant to corrosion and oxidation by heat and to many other things as well.

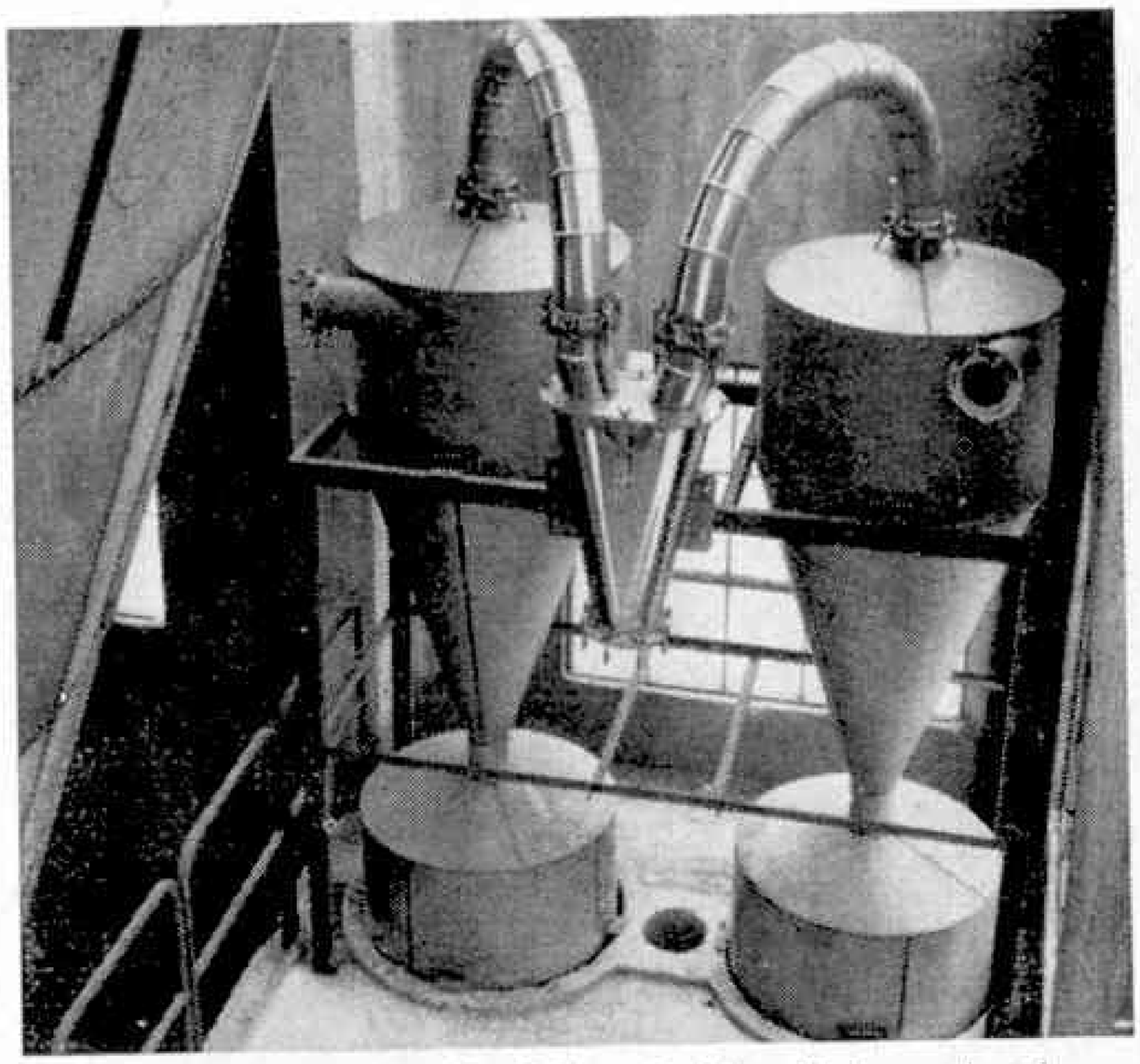
Above is a picture of an automatic milk bottle filling and capping machine, into the construction of which stainless steel enters on a large scale. The article on these pages deals with other applications of the metal in the modern dairy, and we are indebted to the Stainless Steel Manufacturers' Association for the information in it and for our illustrations.

Milk, of course, begins on the farm, and that is where stainless steel begins its service, for the metal parts of modern milking machines are made of the metal. It also figures prominently in the next stage —collecting. Take New Zealand as an example. A few years ago nearly 11,000 individual farmers there got together and organised an entirely new system of collection. Special all-stainless steel road tankers of 1,500 gallon capacity were built, and these collected the fresh milk from the farms, pumped into the tanks from stainless steel vats installed at each farm milking

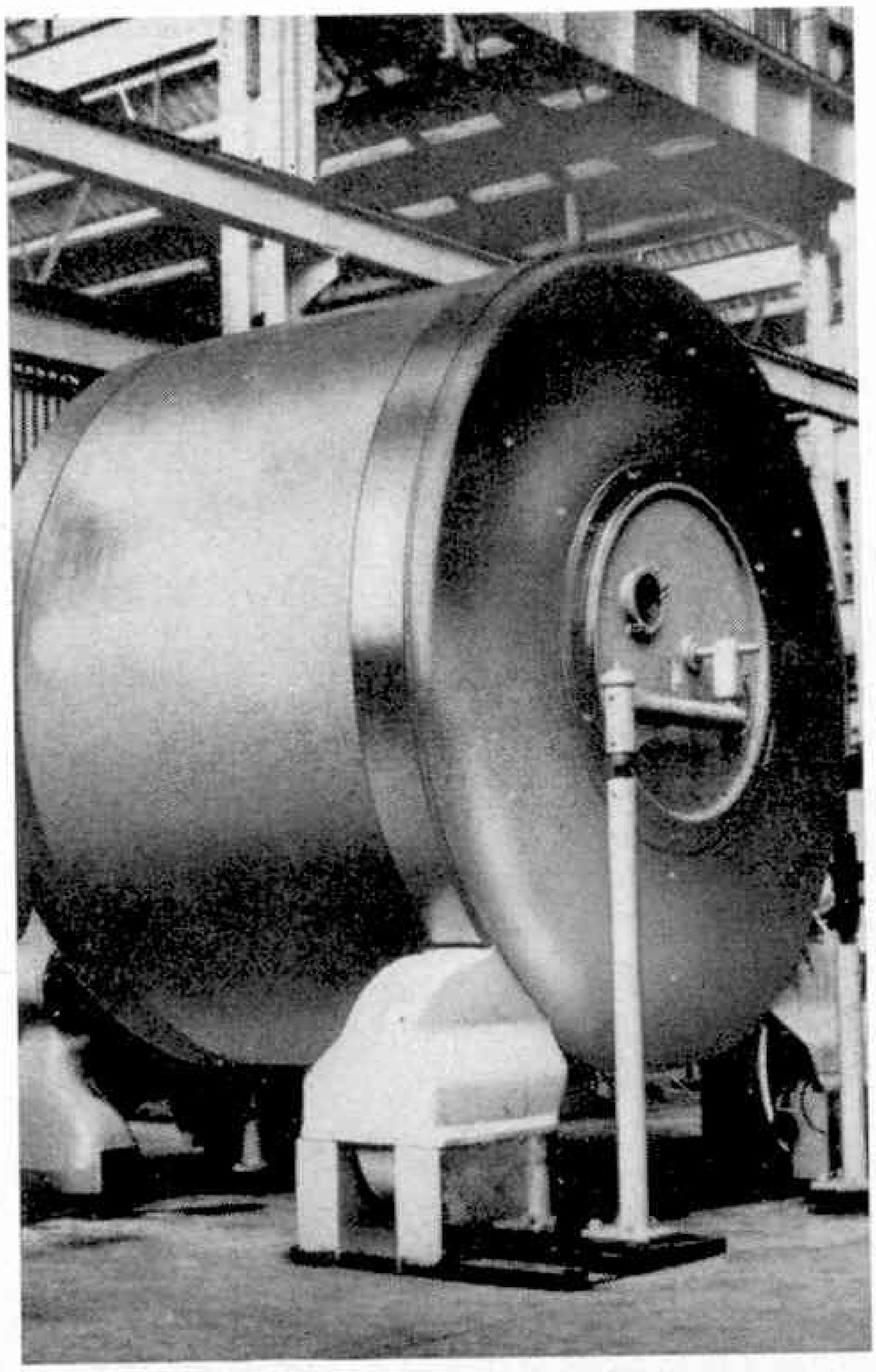
shed, into which the cooled milk had been run to await collection.

Stainless steel tank collection of milk is in existence in Great Britain and elsewhere, although collection by churn is still common. The use of this magical metal in cooling plants on farms and in vessels of various kinds used there also helps to ensure completely hygienic collection of the milk itself.

It is interesting to know that the first large stainless steel rail transport tank, holding 3,000 gallons, was put into use in Great Britain early in 1929, and has been in continuous use with perfect satisfaction. This pioneer tank has been followed by many others, and today one firm alone has in daily use forty 3,000 gallon stainless steel rail tanks, and there are large numbers of milk tanks of the same metal mounted on lorries and trailers as well as those in use on railways.



Spray driers built of stainless steel in which powdered milk is made.



This huge stainless steel churn in a New Zealand dairy applies the final touch in turning cream into butter. Photograph by courtesy of Andersons Ltd., Christchurch, N.Z.

With rapid road and rail transport, milk reaches large dairies in fresh condition and is processed promptly. In the pasteurising and other operations it undergoes, stainless steel again plays an enormous part. In fact, in the activities of the modern dairy, from the moment that the milk leaves the farm until it is run into bottles, its only contact is with stainless steel. It ends in insulated stainless steel tanks, which are refrigerated, and it is from these tanks that it is pumped to the bottling plant. There each bottle is filled and capped, the operation being carried on continuously and automatically. Finally, the bottles are placed in a refrigerated storage section awaiting despatch to the doorsteps of the millions of homes to which it is destined. And this process goes on every day in the year, seven days a week, with no time off for holidays. These conditions make rapid cleansing necessary and maintenance easy, two requirements for which stainless steel equipment is well qualified.

The bottles have an important part to play. They must take their share of the protection that is given to the milk, and for this it is essential to ensure that they are perfectly clean when they are lined up in the bottle-filling machines. Complicated machinery takes in the crates of empty bottles and conveys them to washers, where jets of detergents, followed by powerful rinses of hot clean water under pressure,



Modern cheese-making in progress. Here the curds are being turned to hasten drainage of the whey.

make sure that every one of the thousands of bottles per hour passing through this process is really fit for the milk to enter. The plant is so designed that no steam from the plant escapes into the atmosphere.

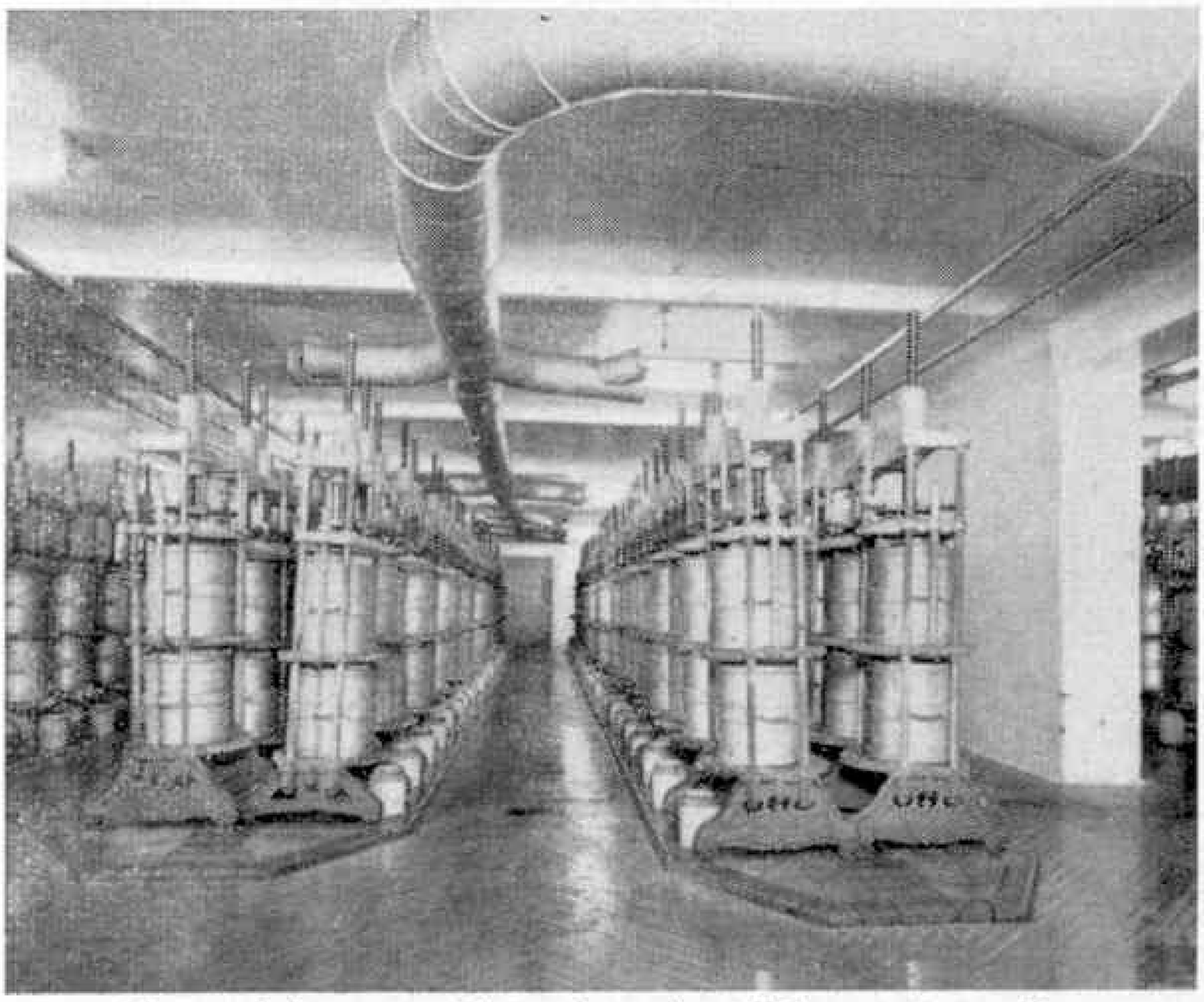
Not all the milk produced on the farms ends up in a bottle. Some of it is manufactured into other products, evaporated and condensed milks, for instance. One of these products, probably the most important, is butter. Butter is fundamental today, and how it can affect our lives is illustrated in a rather curious way by our friend Ybsur, from whom I again quote.

I had first-hand experience of the vicious butter riots in ——. Fundamentally the two extremes were opposed on the question of whether butter should be spread on the downward face of the slice thus giving some protection against cosmic radiation, or on the upper face thereby allowing gravitational force to assist the natural adhesion of the butter to bread. Interesting though the conflict was, I observed the unwritten law of neutralism, and did not support either side.

If you can identify the country in which this terrible conflict took place, you can decide for yourselves which of the two sides you wish to support, and act accordingly. I remain neutral, like Ybsur, in the hope that the struggle between the upper and lower siders of the slices will never become so widespread as that between the Big Enders and Little Enders in Lilliput, that mystic country explored by Gulliver. There I could never see why there should be a quarrel. So long as you get into the egg neatly and quietly, what does it matter how you do it?

But let us keep to butter, having now realised how tremendously important it is. To make it the milk is pumped from the tanks through a pre-heater to separators, which as the name implies separate the cream, the immediate source of butter. The cream is deodorised and pasteurised, which, of course, means that it is deprived of any smell and that any germs there may be in it are destroyed. Then it passes to the churns that turn it into the more or less solid form that we all know.

I feel sure that Ybsur's ideal churn was a wooden barrel with a large handle at the end, the whole contraption looking like a sort of mangle, in which turning by hand caused some of the components of the cream to coagulate to yield this staple



Cheeses being pressed into shape in stainless steel moulds.

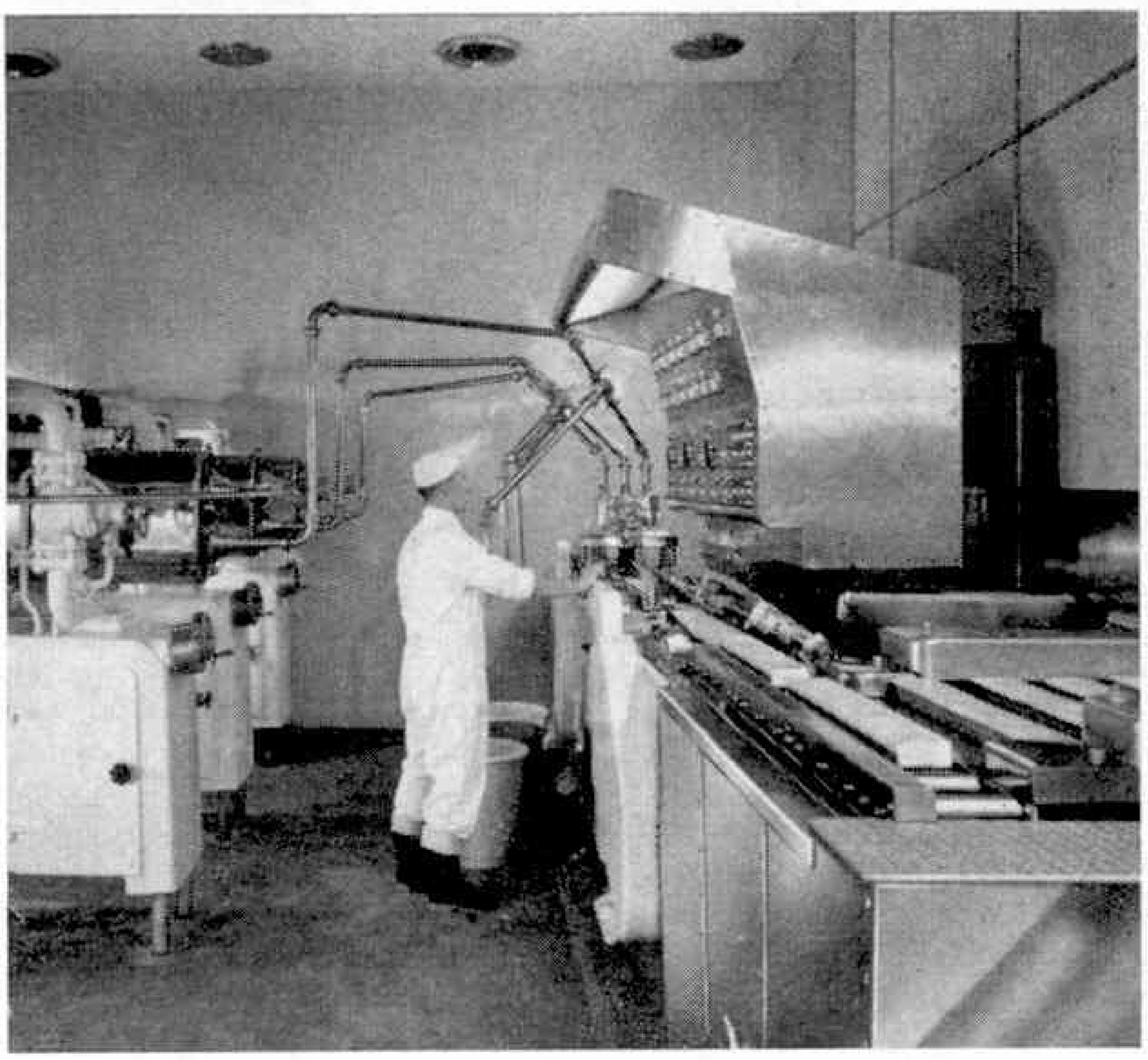
food of ours. But today churns of that kind are only to be found in small farm dairies. There is a picture of a modern churn in a butter factory on page 555, and a mere glance is sufficient to show what a vast difference there is between former and present-day methods.

Needless to say, the churn of today, to be seen at work in the great butter-making factories of this and many other countries, is made of stainless steel, because of its resistance to corrosion. One point of interest here is that the surface of the metal remains perfectly smooth. There are no cracks or crevices in which scraps of butter — or should it be scrapes?— can possibly hide themselves and then go bad or rancid. Even if there were, there would be no danger, for the cleansing processes for churns are just as thorough as are those for the tanks and other vessels that we have met already in this story.

Stainless steel plays a similar part in the production of evaporated milk and, with more evaporation, of condensed milk, and powdered milk. In one method of making the last-named of these what is known as the roller process is used. In this the milk is dried on two parallel cylindrical rolls heated internally by steam. The milk solids adhere to the rollers and are then removed by means of a knife adjusted along them, the film removed being broken up through a wire mesh sieve.

Suppose now we turn to cheese, which is exactly what the milk does in the cheese-making factories. Cheese has been one of our foods for many thousands of years, and even by the ancient Greeks was made in much the same way as many housewives make it now, that is by solidifying the milk with rennet and allowing the curdled mass to drain. There are many varieties of English cheese, and even today cheese-making is concentrated more or less in three areas, the South West, the West Midlands and the North West.

In the cheese-making room of a modern factory there are lines of great stainless steel vats, in which the milk is warmed, a special culture being added to raise the acidity in the liquid. This causes the milk to solidify into a junket that is cut into small cubes by means of multi-blade stainless steel knives that are passed through it lengthwise and across the vat. The junket becomes curd, which forms the cheese, and whey, the remaining liquid. The mixture is stirred while being slowly heated, the curd shrinking and becoming firmer as the whey is expelled. At the right moment, detected by measuring the acidity of the mixture, the curd is allowed to settle and the whey is drawn off.



An ice cream cutting and packaging machine at work. On the left are freezers from which the ice cream is extruded to the machine.

Still in the stainless steel vats, the curd is cut into blocks, which are turned every 20 minutes or so and finally broken into small pieces. Salt is added to improve the flavour, and the curd is then filled into a cloth-lined mould and put into a press. There it is watched and cared for over several days and is then bandaged to protect it during the weeks that it is about to spend in the ripening room, where the cheeses are carefully turned at intervals to ensure even ripening.

There is a lot more to the story of milk and milk products, but my space is almost filled. I can only mention the importance today of one of them—ice-cream, which has been fairly described as "not just a treat but a food". (*Continued on page 574*)

Among the Model-Builders

By "Spanner"

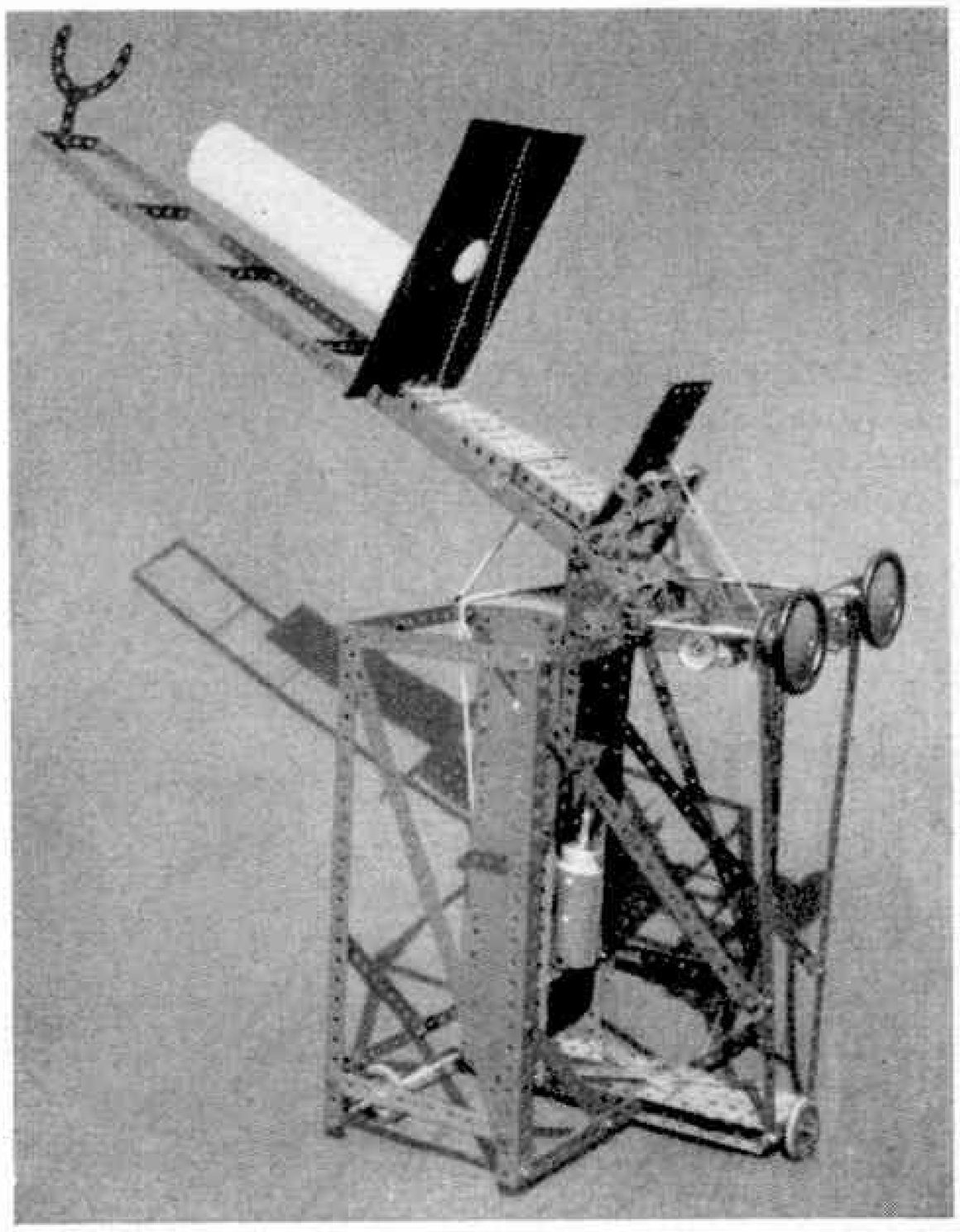


Fig. 1. An astronomical telescope stand constructed by A. Vijayakumar, Madras, India.

Indian Reader's Telescope Stand

Recently I received from A. Vijayakumar of Madras, India, the photograph of a Telescopic Stand reproduced in Fig. 1. This stand was built mainly from a No. 6 Outfit, with the addition of a few extra parts. My young Indian friend was not just building a model, however, for this stand was intended for practical application with an astronomical optical lens system, and it was indeed used to take two very fine photographs of a solar eclipse, visible in India on the 19th April, 1958.

In view of the precision necessary for photographing celestial bodies successfully such an instrument must be very accurate in all its movements, and the builder of this model is to be complimented on the achievement of such fine results with the use of so few moving parts.

Interesting Steering Mechanisms

An interesting arrangement for a steering mechanism for model vehicles is shown in Figs. 2 and 3. It was suggested by Mr. P. Webb, Camberley, Surrey, some time ago, and is constructed as follows. Two Angle Brackets are bolted to the faces of two Bush Wheels 1 and are pivotally connected by a 1" Axle Rod 2 to the ends of $5\frac{1}{2}$" Strips, which are spaced by Double Brackets.

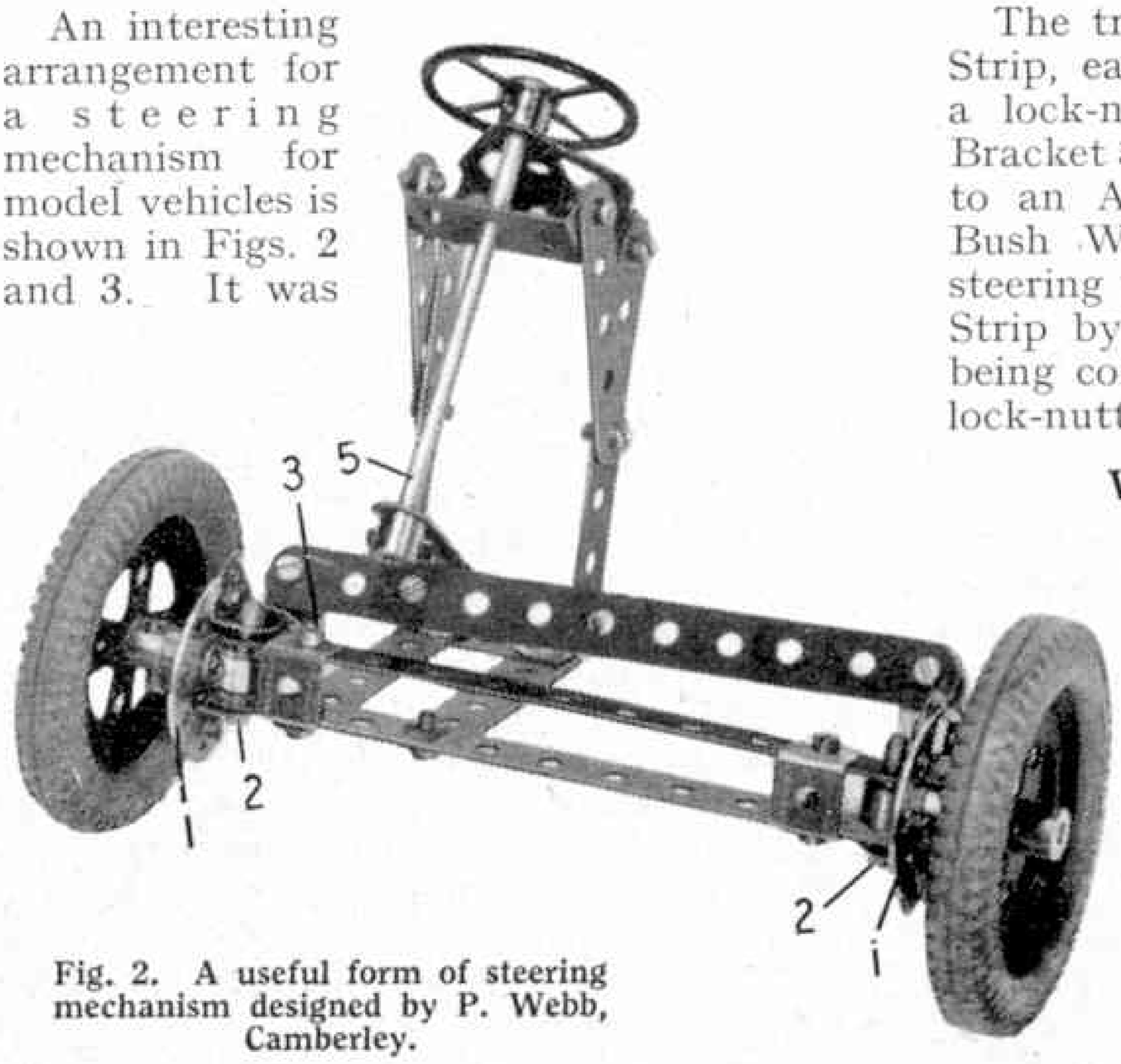


Fig. 2. A useful form of steering mechanism designed by P. Webb, Camberley.

The tracking is effected by another $5\frac{1}{2}$" Strip, each end of which is connected by a lock-nutted bolt to an Obtuse Angle Bracket 3 that again is pivotally connected to an Angle Bracket 4 attached to the Bush Wheel. The Rod 5 forming the steering column is linked to the tracking Strip by a Crank, the arm of the Crank being connected to an Angle Bracket and lock-nutted.

Wobble Shaft Variable Gear

To construct this interesting variable gear mechanism (Fig. 4), two $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates 1 and 2 are connected together by means of two $5\frac{1}{2}"$ Angle Girders. Four $1\frac{1}{2}"$ Corner Brackets are used to form legs for the casing thus made. To each Flanged Plate a Double Bent Strip is attached, one of which is seen at 3. A Universal Coupling is now fixed to a $1\frac{1}{2}"$

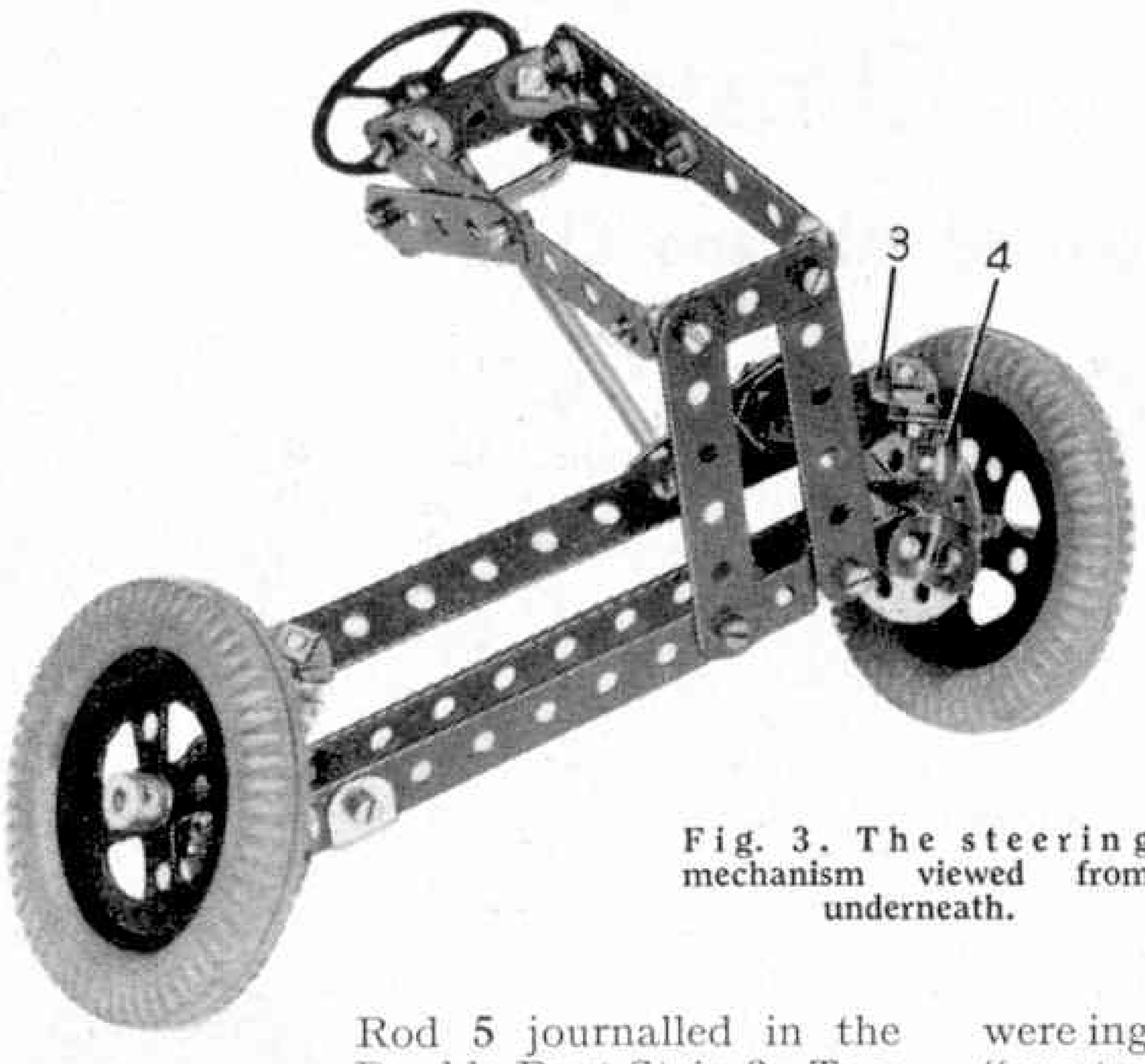


Fig. 3. The steering mechanism viewed from underneath.

Rod 5 journalled in the Double Bent Strip 3. To a Face Plate 6 two 2½" Angle Girders 7 are bolted, the Girders being spaced apart at each end by means of three Washers. The builder should note that the slotted holes of the Girders must be used in bolting them to the Face Plate.

The Face Plate 6 is secured to a 1½" Rod that is journalled in a Double Bent Strip, and it is fitted with a further Face Plate 8, in which is a Threaded Pin that forms a handgrip. Two 2½" Strips 9 are now placed between a Collar and a Ratchet Wheel on a 6½" Rod 10. To each Strip 9, a Pawl without boss is attached loosely by means of a ⅜" Bolt and two nuts. The Pawls are held against the teeth of the Ratchet Wheel by a length of Spring Cord.

Carried at each end of the Strips 9 is an Adaptor for Screwed Rod 11, and this in turn carries a 3½" Strip 12 that is held in place by a Collar. A 4" Rod 13 is secured in the Universal Coupling, and fitted with two 1⅛" Flanged Wheels 14. One end of this Rod projects into the slot between the Girders 7. The Strips 12 are placed on the Rod 13, behind the Flanged Wheels.

If the handwheel 8 is rotated fairly quickly, it will be found that the Rod 13 with the weights 14 will tend to keep towards the outer end of the slot between the Girders 7, causing the Pawls to move the Ratchet Wheel through several teeth, but on applying pressure to the Rod 10 the Rod 13 moves towards the centre of the slot, thus transmitting a shorter but more powerful stroke to the Pawls.

Birds and Beasts Model-Building Competition

The "Birds and Beasts Model-Building Competition" announced in the *Meccano Magazine* earlier in the year, proved extremely popular and many of the entries received were ingenious and fascinating. Some of the "creatures" created by model-builders were quite out of this world, and were merely figments of imagination, but others represented actual birds, animals, insects, etc., with which most of us are familiar! The principal prize-winners were as follows:

Section A: First Prize, Cheque for £4 4s., M. Taylor, Sydney, Australia; Second Prize, Cheque for £2 2s., J. C. Wells, Leeds, 8; Third Prize, Cheque for £1 1s., A. McDonald, West Lothian, Scotland.

Section B: First Prize, Cheque for £4 4s., M. Lobenberg, London S.W.5; Second, £2 2s., J. Ford, Sudbury; Third, £1 1s., G. McLernon, Lisburn.

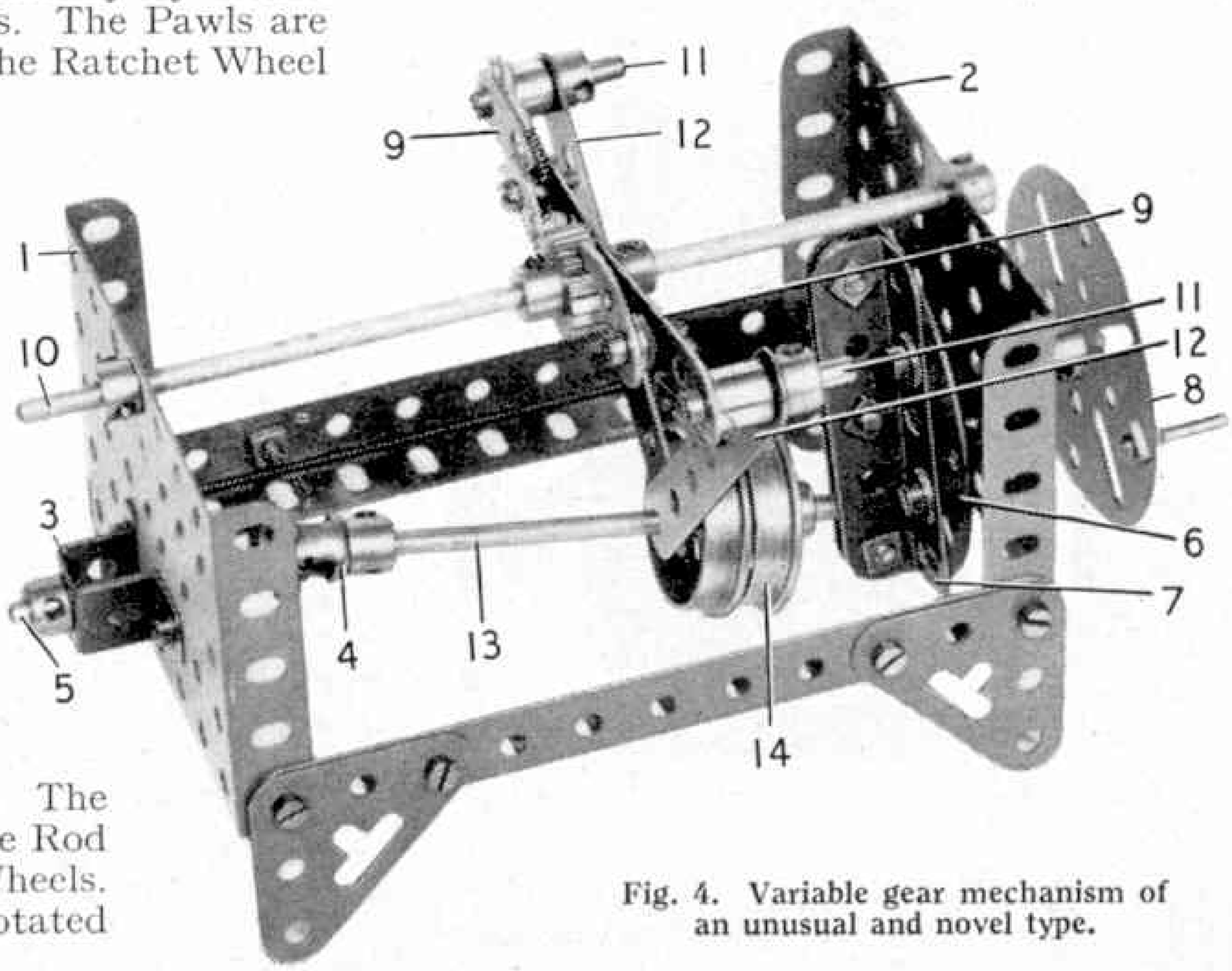


Fig. 4. Variable gear mechanism of an unusual and novel type.

Time for Christmas

An Easy-to-build Meccano Clock

WE receive many requests for information on clock construction, and although we have included several clocks of various types in past issues of the *Meccano Magazine*, these requests still come along. We are therefore including once again illustrations of a very popular and successful clock mechanism that was described in the *Meccano Magazine* some years ago. This mechanism is weight-driven, and it can be incorporated in a "grandfather" type of casing or if desired in the smaller type of case usually known as the "granddaughter" type. The Clock will run for about 6–8 hours on one winding. When the mechanism is completed the builder will find it an interesting but quite an easy task to design and construct a suitable casing for it, and this can be as large and elaborate as the parts available to the builder permit.

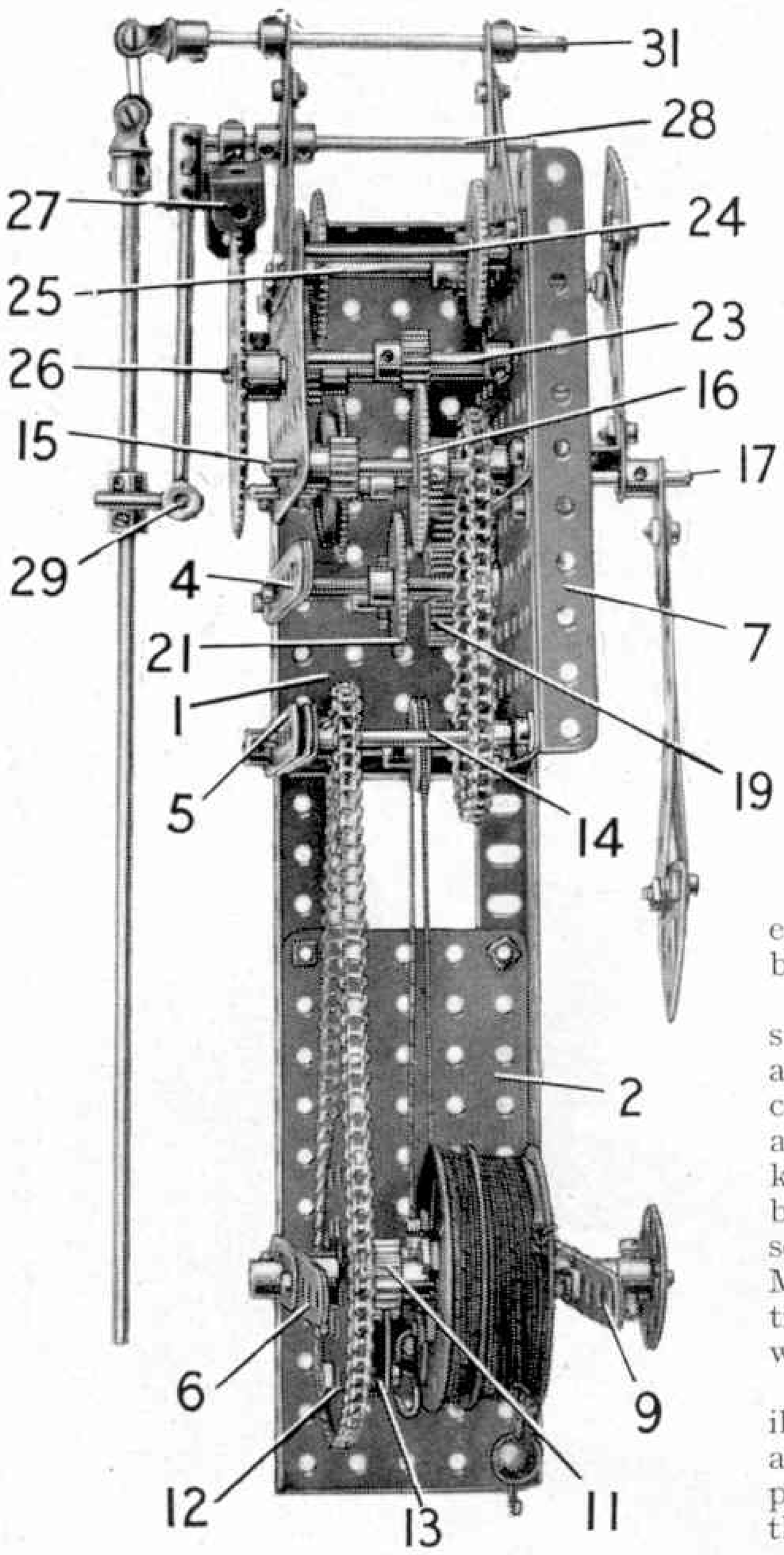


Fig. 1. The Clock Mechanism. Details of the gear trains are seen in this side view of the mechanism.



Fig. 2. The Clock pendulum and weight "bob".

A clock is one of the most satisfying subjects for Meccano model-builders and a real challenge to even an experienced constructor, for careful and accurate assembly is essential if reliable time-keeping is to be obtained. Nothing could be more fascinating and satisfying, than setting a clock, constructed entirely from Meccano parts, to work, and seeing how it ticks off the seconds and marks up the hours with "clockwork regularity".

As a model of this kind requires large illustrations to show its construction clearly and as the space available here does not permit us to include such illustrations and the rather lengthy constructional details of the model, we are publishing the constructional details separately, together with a list of the parts required to build

the model. Any reader who wishes to build this Clock can obtain the instructions free of charge by writing to the Editor, *Meccano Magazine*, Binns Road, Liverpool 13, enclosing a 3d. stamp to cover postage. Readers living in Canada, Australia, New Zealand, South Africa, Ceylon, Italy, Rhodesia and the United States of America, should write to our main agents in those countries, enclosing suitable stamps for postage.

Applications for the instructions should be made at once, however, as supplies are limited.

The Clock Mechanism is illustrated complete in Fig. 1, and while it is quite easy to build up, it will keep good time once it is properly adjusted. The pallet and escapement wheel of the Clock consist in this case of a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip and a 3" Sprocket Wheel. The Double Angle Strip has to be carefully bent to the shape shown in Fig. 3 so that when it is horizontal and the pendulum is vertical, the lugs of the Double Angle Strip just clear the teeth of the Sprocket. When the pendulum is in motion the escapement wheel is allowed to move through the space of one tooth for each swing.

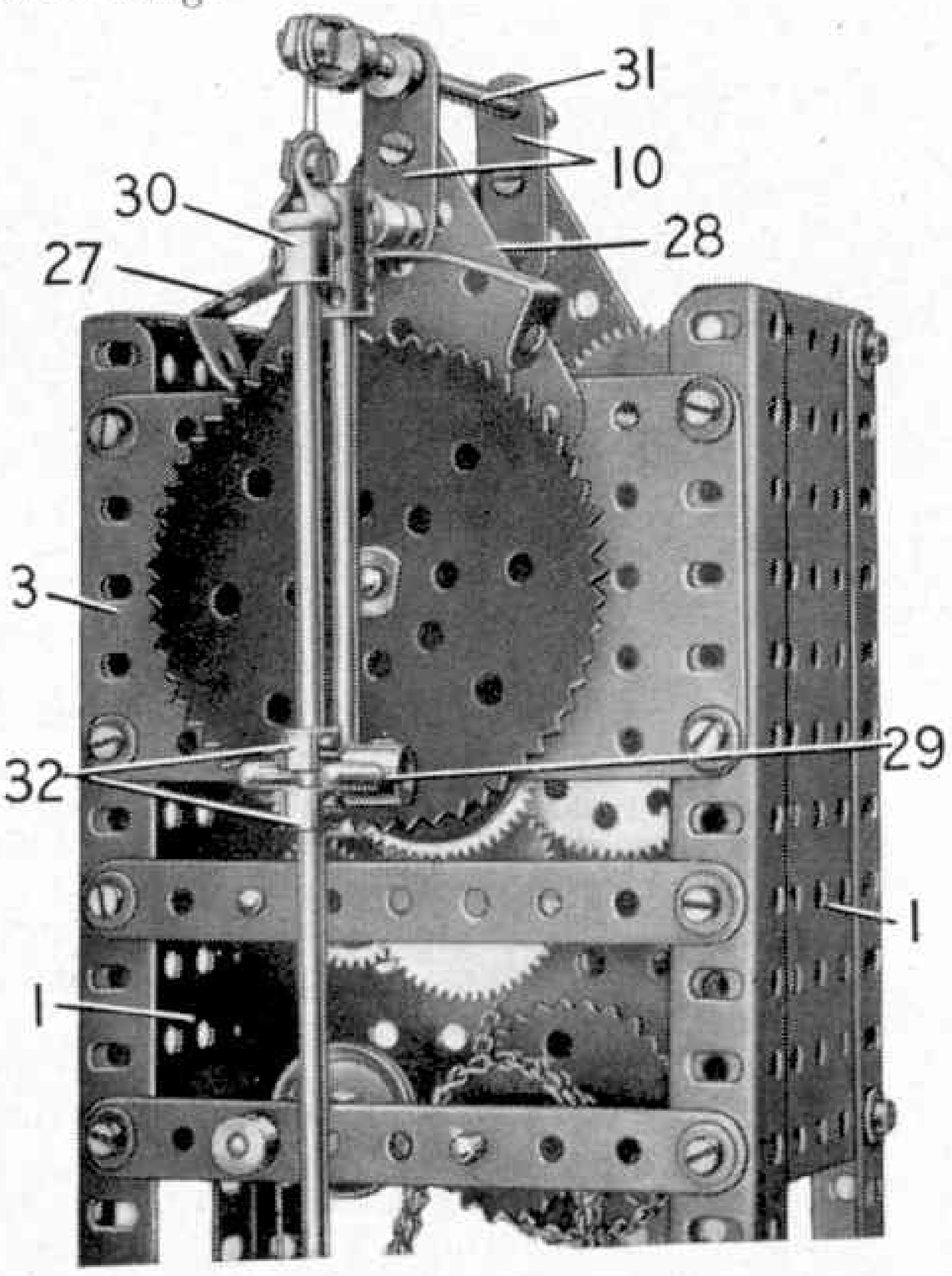


Fig. 3. The back of the Clock showing details of the escapement device.

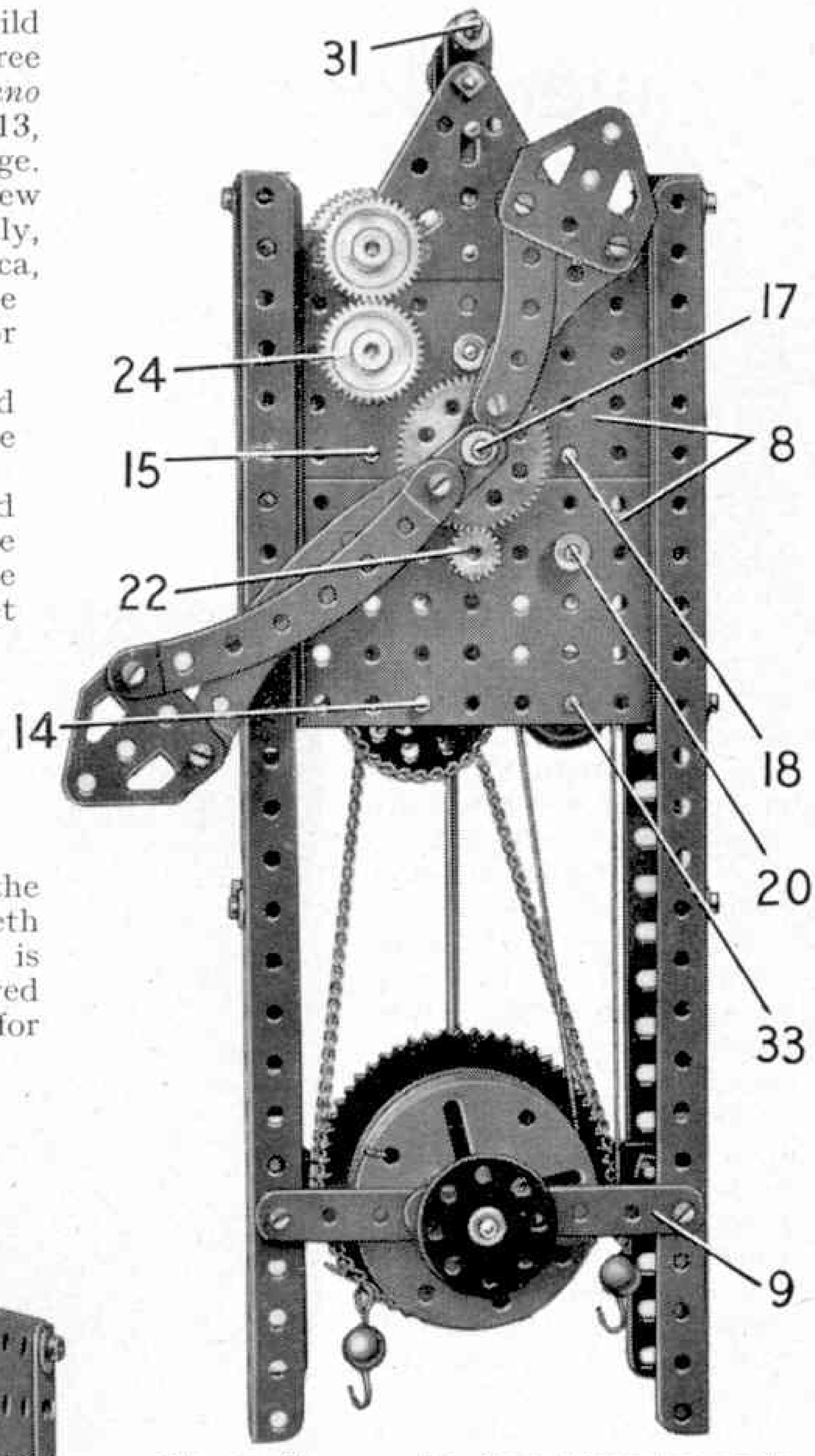


Fig. 4. The complete Clock Mechanism ready for mounting in a suitable casing.

The Clock is regulated by adjusting the position of the pendulum bob (see Fig. 2). If the Clock gains in time the position of the bob should be lowered, while if it loses time it will be necessary to move the bob to a higher position on the Screwed Rod.

Now don't forget, write for your copy of the instructions for this model, and a list of the parts required, without delay.

It is a real thrill to complete a model of this kind and set it working and we are sure that everyone who builds this Clock will feel a sense of achievement as he watches the pendulum swing to and fro and listens to the steady "tick, tick" of the escapement.

Winter Model-Building Competition

A Chance to Win a Prize

LAST month we announced the first of our Winter Competitions, in which cash prizes are offered for the most original and best built Meccano models of any kind. This Competition is open to everyone who owns a Meccano Outfit.

If you wish to enter the Competition all you have to do is to think of a new model, and then set to work to construct it as neatly and realistically as possible from standard Meccano Parts. The prizes will be awarded for those models that are the most original in subject, and are the best designed and proportioned.

When your model is completed it is only necessary to obtain either a photograph or a good sketch of it, and send this to us. You must not send the actual model. The photograph or drawing need not be your own work, but it is absolutely essential that the model itself should be. Entry forms are not required and there are no fees to be paid. The Competition is open to readers of all ages living in any part of the world.

The Competition will be divided into the following two Sections: A, for competitors living in any part of the world and under 14 years of age on 30th January next. B, for competitors aged 14 years or over on 30th January, 1960.

Prizes will be as follows: First, Cheque for £4; Second, Cheque for £2; Third, Cheque for £1; Ten prizes each of 10/–, and ten Consolation Prizes each of 5/–. Certificates of Merit also will be awarded.

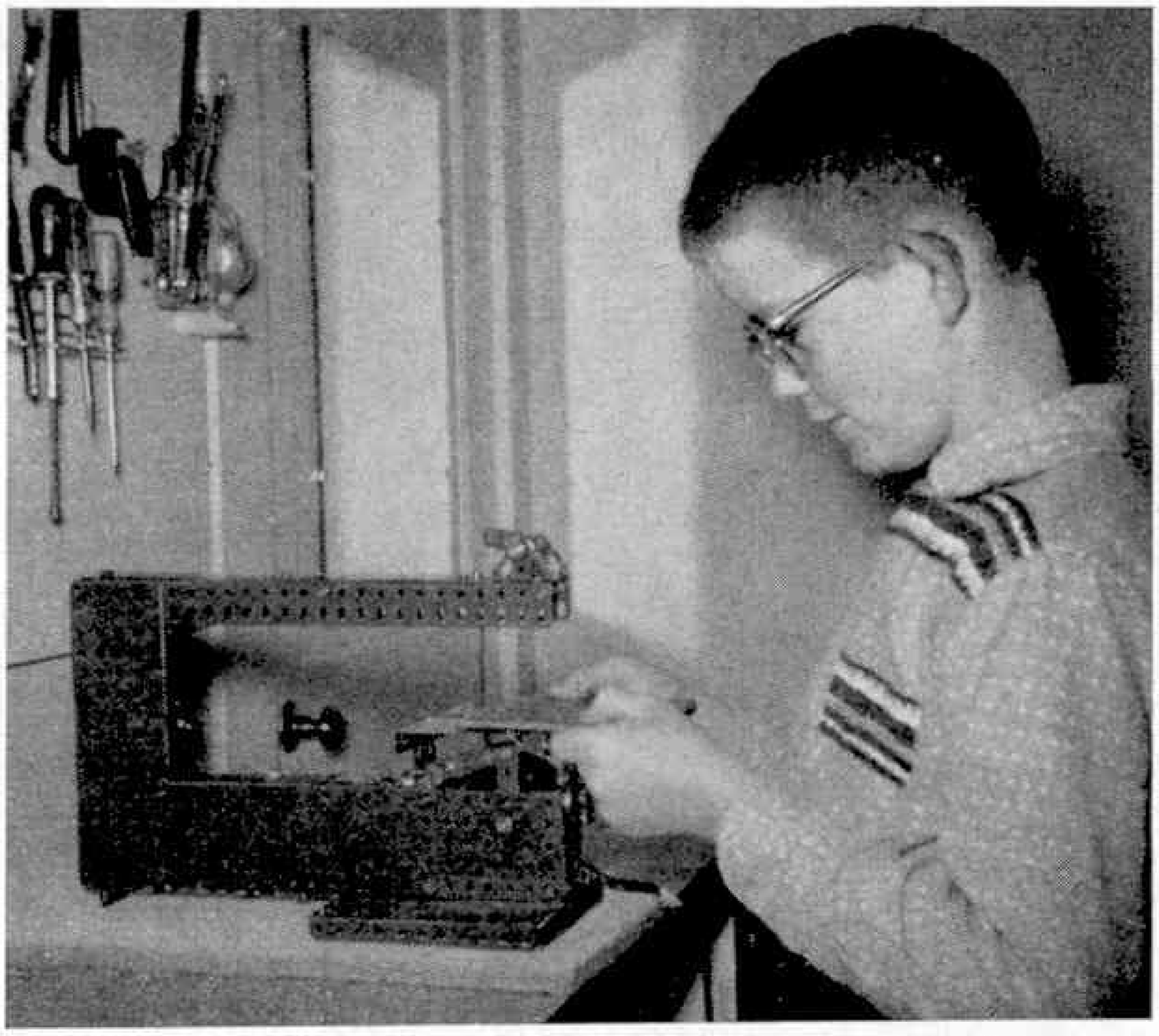
As models of any kind whatever may be submitted, you have a very wide range from which to choose your subject. A model that really "works", or that may be put to some practical use, will stand a better chance of winning a prize than a model that is not built to work. Any number of parts may be used in building models, but good solid construction will count more than mere size alone.

When preparing your entry you should take care to write your age, name and address clearly on the back of each photograph or drawing submitted.

Finally, you must post your entry in time to reach this Office on or before 30th January, 1960, and the envelope should be addressed "November Meccano Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13".

Each prize-winner will be notified by letter as soon as possible after the closing date.

Prize-winning entries become the property of Meccano Limited, but unsuccessful entries will be returned if a stamped addressed envelope is enclosed.



Kenneth Cameron, son of Dr. Keith W. Cameron, Ary, Kentucky, U.S.A., at work with a jig-saw cutting machine he built from his Meccano Outfit. Kenneth is following in his father's footsteps, for Dr. Cameron also was a keen Meccano enthusiast in his early days.

Club and Branch News

WITH THE SECRETARY

CHRISTMAS GREETINGS

It is with very great pleasure that I again wish all members of the Guild and the H.R.C., and all Clubs and Branches, a Merry Christmas. Already members will be eagerly anticipating the fun and frolics, and gifts and "eats" that Christmas brings. In many Clubs and Branches these delightful things are the ingredients of a grand Christmas Party that brings the first of the Winter Sessions to an exciting close. I shall look forward to hearing about these celebrations.

MECCANO CLUB RECENTLY AFFILIATED

ADELAIDE (AUSTRALIA) M.C.—*President:* Mr. J. T. Donnelly, Paisley House, Wyatt Street, Adelaide, S. Australia.

H.R.C. BRANCH RECENTLY INCORPORATED

No. 575. ADELAIDE (AUSTRALIA).—*Chairman:* Mr. J. T. Donnelly, Paisley House, Wyatt Street, Adelaide, S. Australia.

PROPOSED NEW MECCANO CLUBS

Readers living in, or near to, Shipley, in Yorkshire, may be glad to know that a Meccano Club is being formed there. The organiser is Mr. Malcolm D. Jonson, and readers interested should get in touch with him at his address: 9 Hawthorne Avenue, Owlet Hall Estate, Shipley, Yorks. Boys of 12 years of age or over who are keen Meccano enthusiasts will be most welcome.

Similarly, for Italian *M.M.* readers living in, or near to, Piacenza, there is news that Mr. Servetti Guiseppe, of Via Costello 36, Piacenza, is endeavouring to establish a Meccano Club. Readers interested should get in touch with him at the above address.

CLUB NOTES

AUSTRALIA

MAYLANDS M.C.—Outdoor activities have been the main feature of the recent programme, with some excellent cycle runs. Film shows continue to be very popular, and a table tennis night held during the school holiday period produced some good matches. One week-end, model-building time was given over to a "How to do it" session, during which members were shown the correct way to use Meccano Sprocket Chain, make good soldered connections, run the Club's film projectors, and the correct way to use the Club Library of books and records. All members were given an opportunity to do these things themselves. *Secretary:* T. Down, 16 Kennedy Street, Maylands, Western Australia.

FREMANTLE M.C.—The Club's Annual Exhibition was held in the Fremantle Town Hall on the 28th-29th August, and donations resulted in a useful sum being added to the Club funds. The principal models exhibited were a walking robot, grab type derrick crane, beam engine, windmill and a merry-go-round. There were many other well-built models. The Club has accepted several offers to put on Exhibitions at various local functions—one notably at a drive-in theatre for a period of six week-nights, at one guinea per hour. Meccano model-building continues enthusiastically, with members busy on many new models. Everyone is looking forward to a grand Christmas party. *Acting Secretary:* W. Bergen, 70 Fraser Street, East Fremantle, Western Australia.

INDIA

GINDIRI SECONDARY SCHOOL M.C.—Two main models under construction are the showman's traction engine and a wall clock. It is planned to have these models completed in time for an Exhibition which will also be an Open Day for the Club and its associated Branch. *Secretary:* Paul M. Thahal, Gindiri Secondary School, Sudan United Mission, P.O. Barakin Ladi, via Jos, N. Nigeria.

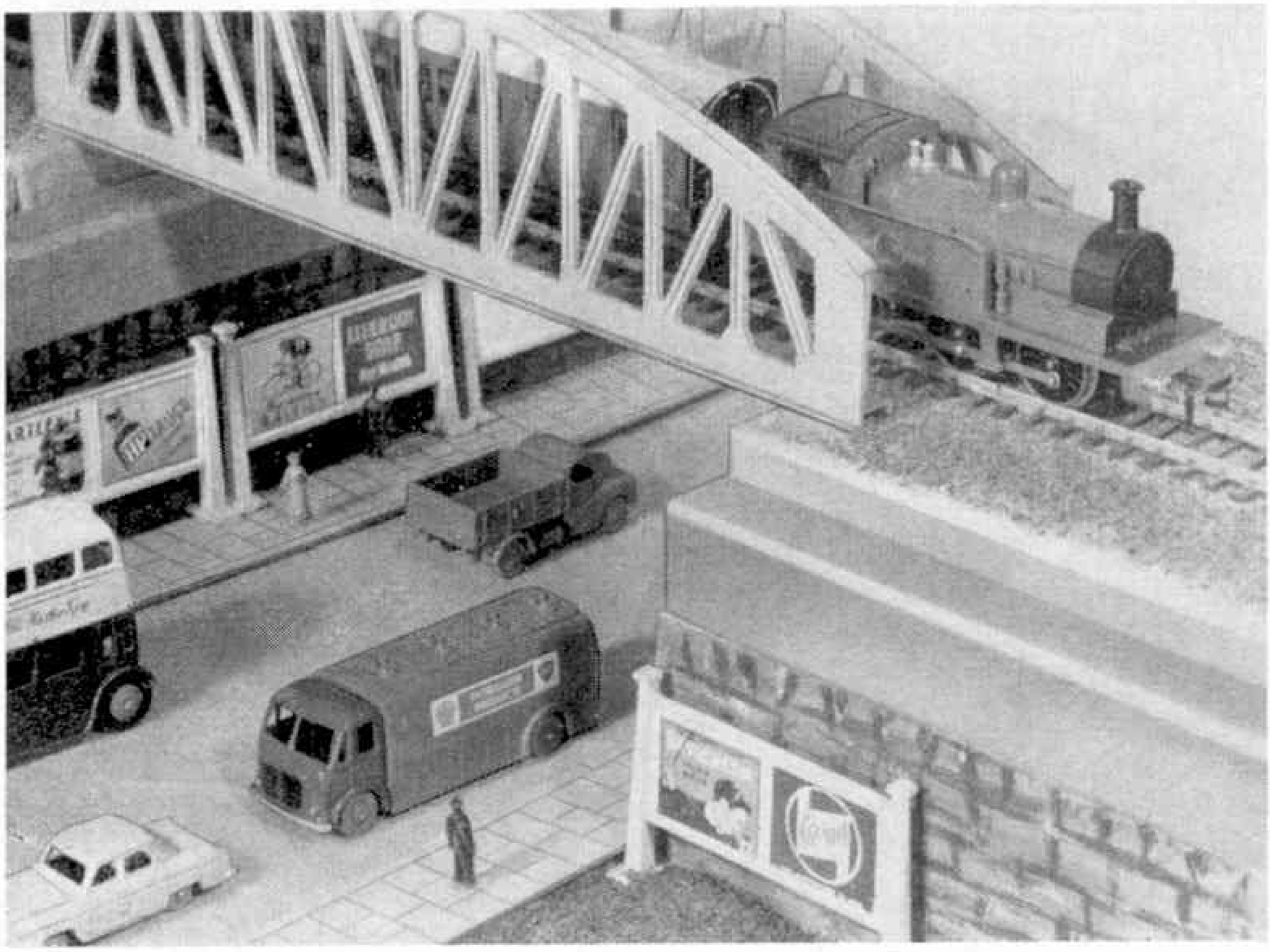
BRANCH NEWS

INDIA

GINDIRI SECONDARY SCHOOL.—The development of the Branch layout has continued, and further track has been fastened down. Additional stations also are being constructed. Train operations within the limits of the layout so far completed have been carried out at some meetings. *Secretary:* Paul M. Thahal, Gindiri Secondary School, Sudan United Mission, P.O. Barakin Ladi, via Jos, N. Nigeria.



Officials and members of the 3rd Wigan (All Saints' Modern School) Scout Group, H.R.C. Branch No. 573. Photograph reproduced by courtesy of J. Blackburn, Esq., Wigan.



The Hornby-Dublo Two-Rail 0-6-0 Tank Locomotive crosses the Girder Bridge above a busy roadway. The Dublo Dinky Toys A.E.C. Mercury Tanker is prominent on the road below.

HORNBY RAILWAY COMPANY

By the Secretary

Two-Rail Sets and Locomotives

BY the time you read this more Hornby-Dublo Two-Rail equipment will have become available, and many of you will already have had the opportunity of examining these in our dealers. Some of you indeed will already have become the fortunate owners of a new Train Set, or a Locomotive. If not, you are probably hoping to be very soon.

Last month I wrote about the first Hornby-Dublo Two-Rail locomotive to appear, the 0–6–0 Tank, a handy little engine that has been welcomed with delight and deserves to find its way on to practically every Hornby-Dublo Two-Rail system, as indeed it no doubt will. It is the first Hornby-Dublo Two-Rail locomotive to appear, and is only made in this form. With one other exception that I will deal with later, the other engines in the Two-Rail system have their counterparts in the familiar Three-Rail range.

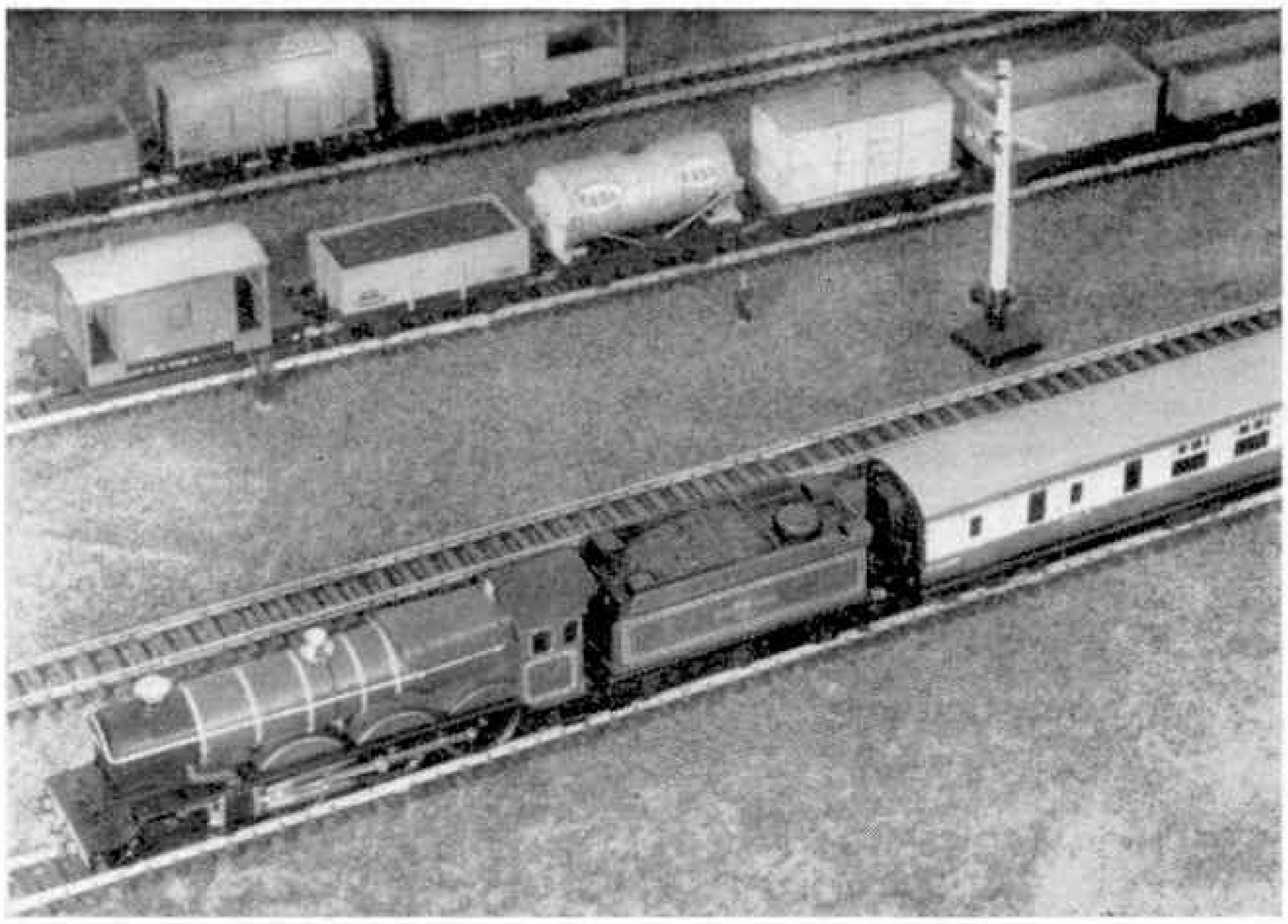
As you may have noticed from the illustrations that are a feature of the Hornby-Dublo Two-Rail coloured folder, the Two-Rail locomotives in Hornby-Dublo bear names and numbers different from the corresponding members in Three-Rail. The upper picture on the next page shows *Denbigh Castle*, which is the Two-Rail version of the Hornby-Dublo Castle already familiar in Three-Rail. The train set in which this fine new engine is included bears the name *Torbay Express*, and the engine and stock are appropriately provided with the necessary train name labels.

A small point to note in this connection is that the name of the train is a sufficient indication of the district that it serves, so there are no actual destination labels for the coaches. The title *Torbay Express* says exactly what it has to in the clearest possible manner.

Freight traffic in Two-Rail is well served by the Hornby-Dublo Train Sets in which the powerful 2–6–4 Tank and 2–8–0 freight locomotives are included. The rolling stock in these sets is nicely varied. The 2–6–4 Tank Set has two wagons with new loads. One of them is the useful Low-Sided Wagon on which is mounted Dublo Dinky Toys No. 068, Massey-Harris-Ferguson Tractor, a dainty little model that looks well when conveyed in this way. The load

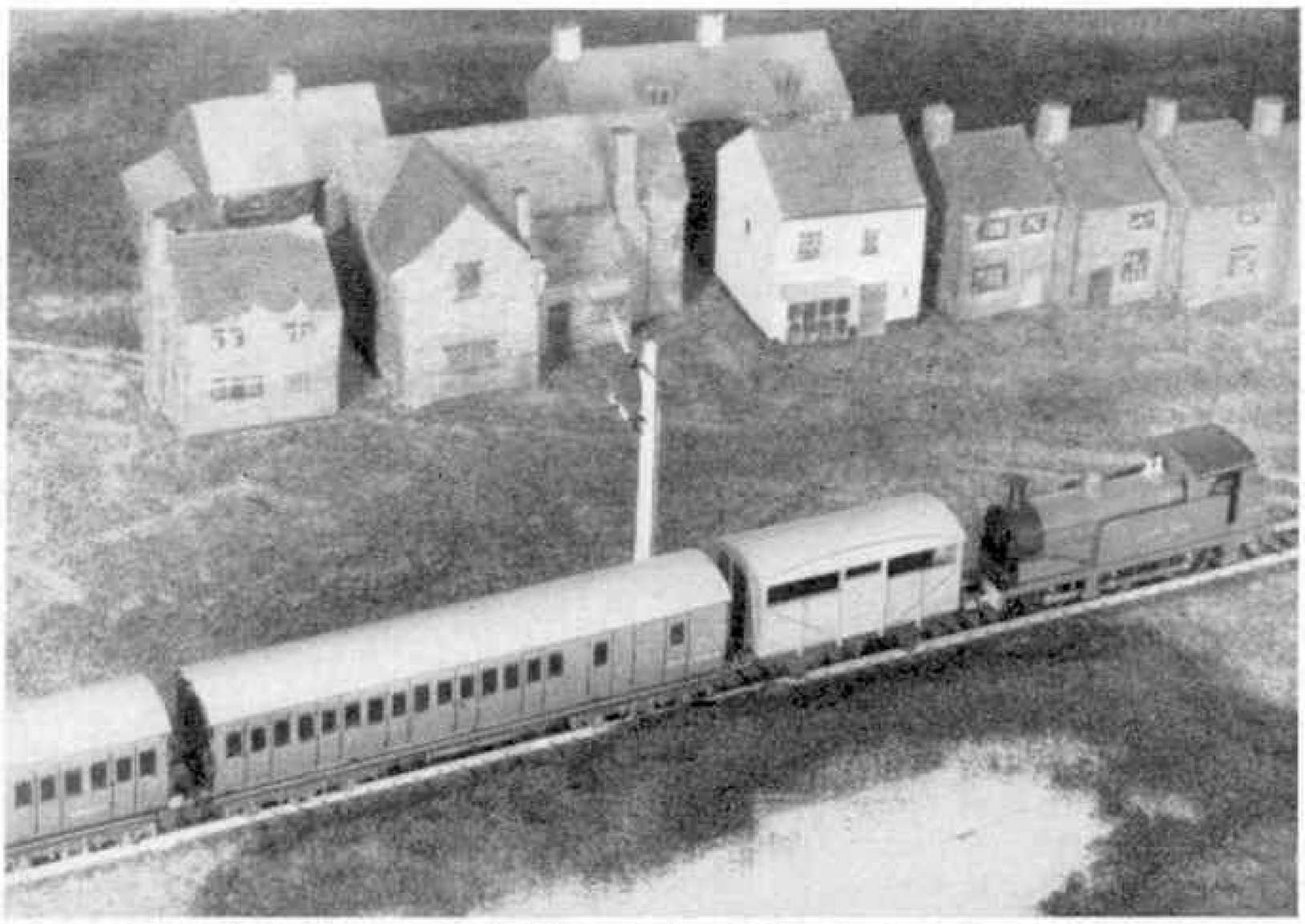
on the other are two baulks of miniature timber. For this type of load the Double Bolster Wagon is just the thing, and so this is included. Like all the Two-Rail Hornby-Dublo locomotives, the 2–6–4 Tank and 2–8–0 can give a good account of themselves in the matter of load haulage, and particularly in even running at slow speeds, which is exactly what is desired when working freight trains.

In its Two-Rail form the popular Hornby-Dublo Diesel Locomotive, in addition to being available separately, also appears in a freight train set. So it is in line with the real locomotives of this class, which are well adapted to mixed goods working. There is no reason why it should not also carry out more important long-distance duties in miniature, as indeed do some of the real ones, so here is a splendid chance for you to run a really up-to-date fast freight train.



"Denbigh Castle" speeds along the track, just like that of real railways in appearance, that is a feature of the Hornby-Dublo Two-Rail system.

Possibly the most eagerly awaited Hornby-Dublo Train Sets have been those representing the L.M.R. and E.R. train services known respectively as *The Caledonian* and *The Talisman*. The former connects London with Glasgow, while the latter links London with Edinburgh via the East Coast route. *The Caledonian* train set includes a new engine, and this is the exception I have already mentioned as available only in Two-Rail form. It is the Coronation class engine No. **46245** *City of London*, which, like its prototype, is attractively finished in the maroon livery adopted by the L.M.R. during recent times for selected members of the class.



A branch line train on a Two-Rail layout headed by the Hornby-Dublo 0-6-0 Tank passes a realistic group of miniature buildings. Houses and similar items are easily made at home.

As many of you will know, the front end external arrangements of some of the City series are different from those of the Duchess 4–6–2s, and the special features concerned are incorporated realistically in the Hornby-Dublo *City of London*. The engine and its tender indeed are remarkably accurate reproductions of the real things and are sure to be greatly sought after.

Finally we have *The Talisman* Train Set, in which the A4

(Continued on page 574)

Permanent Layouts

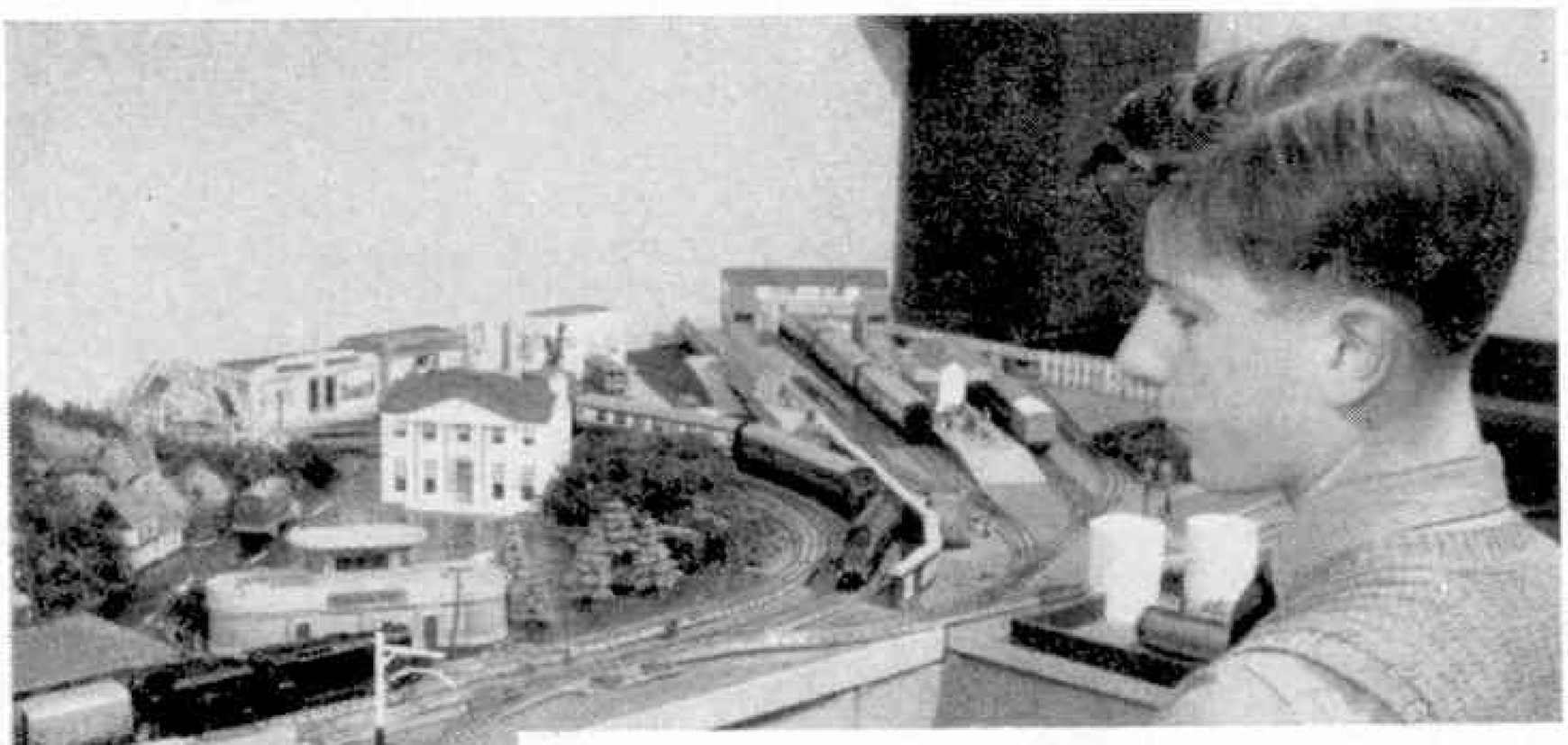
Useful Hints for Growing Lines

By "Layout Man"

LAST month it was portable Hornby-Dublo layouts. This month let me turn to some permanent systems, which after all are the best, if only because they *are* permanent. But they have other advantages too. They are always in place and ready for you to use, and you can simply go to your railway at any time and pick up the thread of operations at the point where you left off last time.

To do this successfully you must, of course, have a plan that itself is satisfactory. Some layouts permanently installed on their own baseboards have been planned and laid down in one complete operation, but as a rule a process of gradual development is necessarily followed. With this it is particularly important that the final plan should be settled, in outline at least, before any of the baseboard construction is begun. And even then it is wise, if space and other circumstances allow, to think out some sort of "shape" or design to allow for extensions you may not make for some time, or that you have not yet thought of, remembering that it is well to allow for bright ideas that may come along later. This will save you from having to add "bits and pieces" later, or indeed from having to build an entirely new base as you extend.

And now to some actual layouts. On this page you see Hornby-Dublo enthusiast S. G. P. Lundy controlling the movements of trains on a layout on which operations are shared with a group of fellow-enthusiasts, all of whom are citizens of the imaginary state of *Lundistan*. The railway system is known as the *Lundistan Government Railways*, in the working of which each member has his own particular responsibility. The locomotives and rolling stock do not have special liveries, but are those of the standard Hornby-Dublo Three-Rail products.

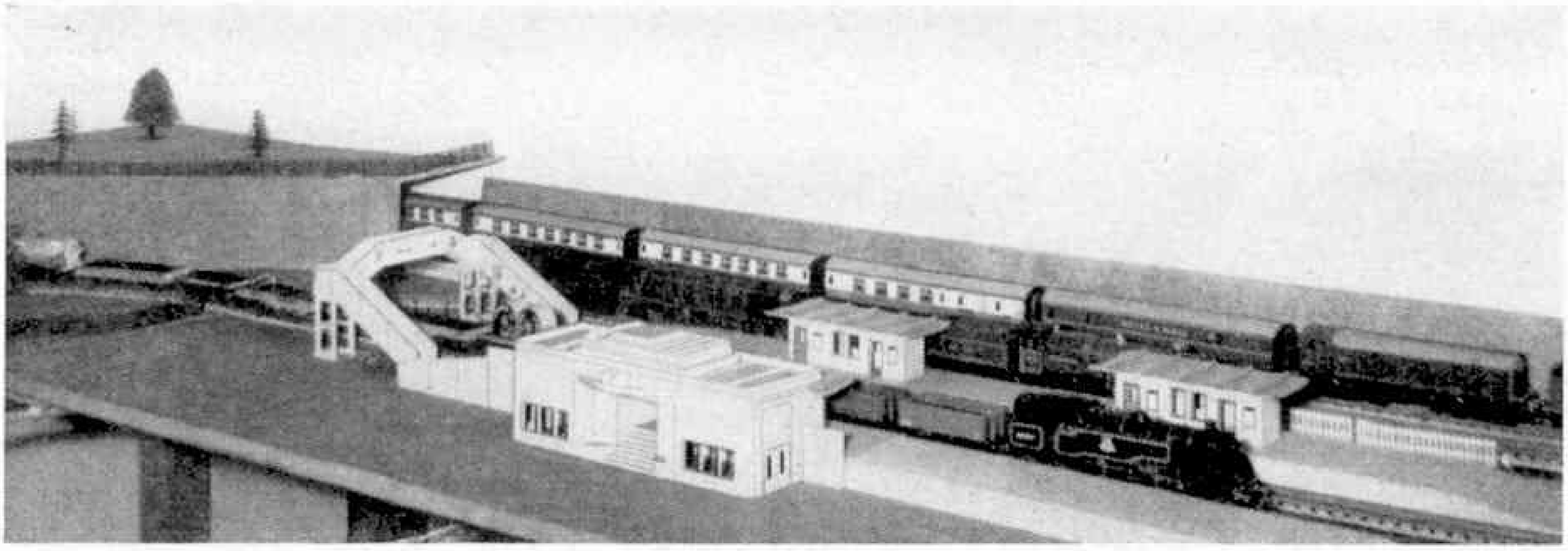


Peter Lundy, of Belfast, busy with the layout that is described on this page.

Where a layout is run on a "common-user" basis, it is specially important that the design should be generally simple and yet permit all the operations necessary to deal with the traffic to be carried out conveniently. This point has evidently had plenty of attention, and the layout includes a double track main line of what is usually known as an oval form. An S-shaped reverse loop connects the opposite sides of the main line and there is in addition a terminal station section within the main oval.

You can see this particular part of the railway quite clearly in the picture. The terminal station has four platform faces, and in addition to this provision for traffic handling there is a Hornby-Dublo Turntable, and a motive power depot where five locomotives can be accommodated. Coal and water facilities also are available.

There is a through station on the main line, smaller in general than the terminus, but of special importance in connection



One end of the Hornby-Dublo layout of Roger Healey, of Worsley. This includes the station that is referred to in the accompanying description.

with goods traffic. The actual carriage of loads is a feature of operations and particularly good use is made of three long wheelbase Tube Wagons that are included in the equipment. Road services are provided, in association with the rail facilities offered, so you will not be surprised to hear that special attention has been given to the road system on the layout. The main road junction is in fact situated in the township served by the terminal station.

Although the railway is a busy one, and there is plenty of passenger and goods rolling stock, there are at the moment of writing just four Hornby-Dublo locomotives to handle the trains. Particular importance is attached to their maintenance in good order for the joint operation of the system, so that the performance obtained is of a consistently high standard.

The first engine to be put into service on the original layout from which the present system has developed, one of the familiar and popular Hornby-Dublo 0–6–2 Tanks, is still in use and it has never suffered a major breakdown during its three years of service.

As is necessary on any system that is intended to be really permanent, the baseboard, arranged in two main sections, is well framed and supported underneath. A point that I am sure you will find attractive is the sort of "lower deck", formed at a convenient spot for the accommodation of the control equipment. In this position it does not occupy space that could be used for the layout itself, a very good feature, and the controllers and so on are out of sight of the railway, yet readily accessible to the operator. As a rule, one or two simple tools such as a Hornby-Dublo Spanner, and a small screwdriver are kept at the desk ready for "on the spot" repairs, as well as a supply of lubricating oil.

Another permanent layout, on which the frame, and supports of the baseboard have obviously been well arranged, is that shown by the picture and diagram on this page. This belongs to Roger Healey and, like the layout just described, it has been in use for some three years. The original layout had to be changed because of house removal, but extension of the system in its new home proceeded so well that a special walled-in site had to be arranged for the railway in the attic. Here space was found for the 8 ft. × 8 ft. system, which thus has a room of its own —with a very fine view of the railway!

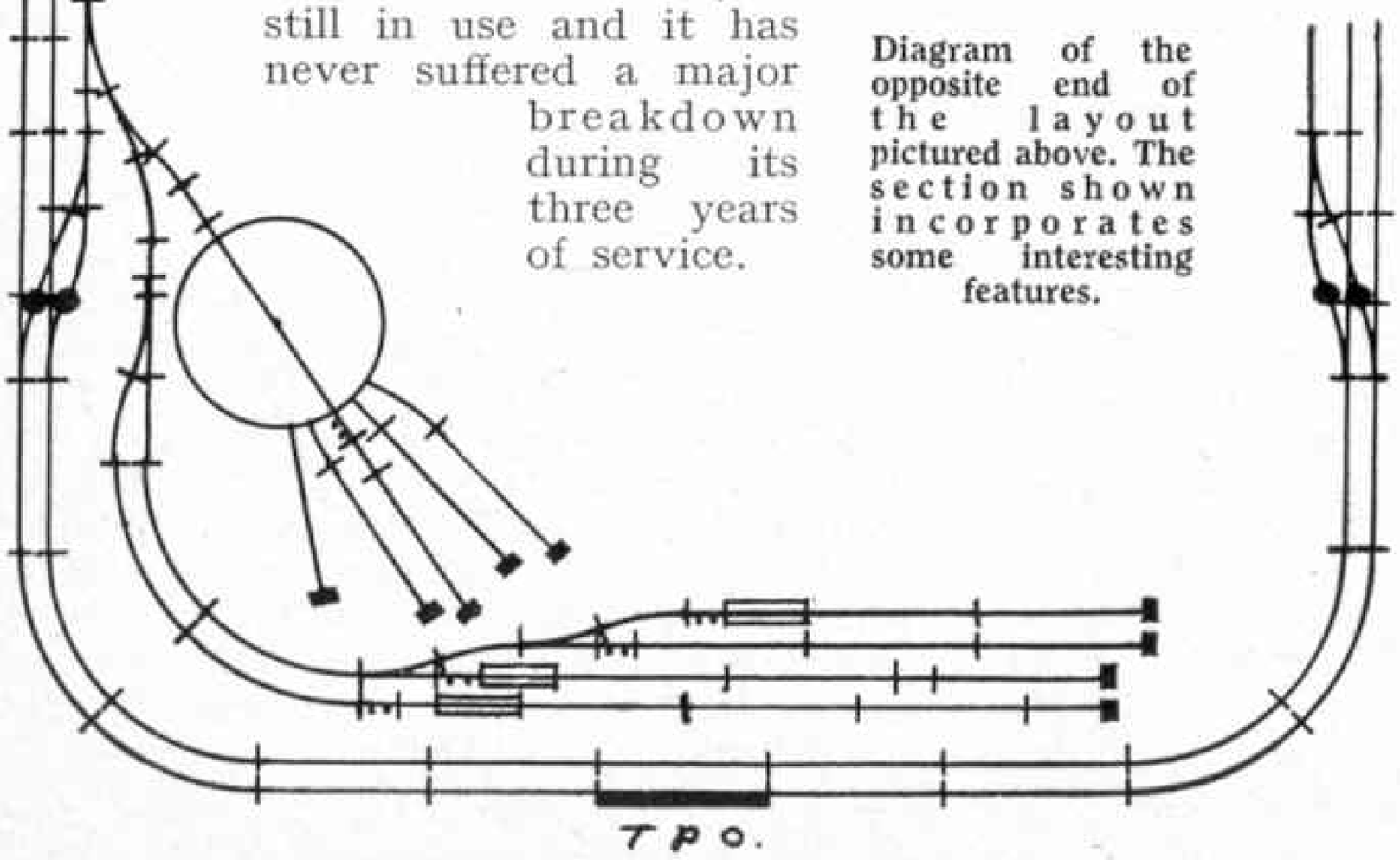
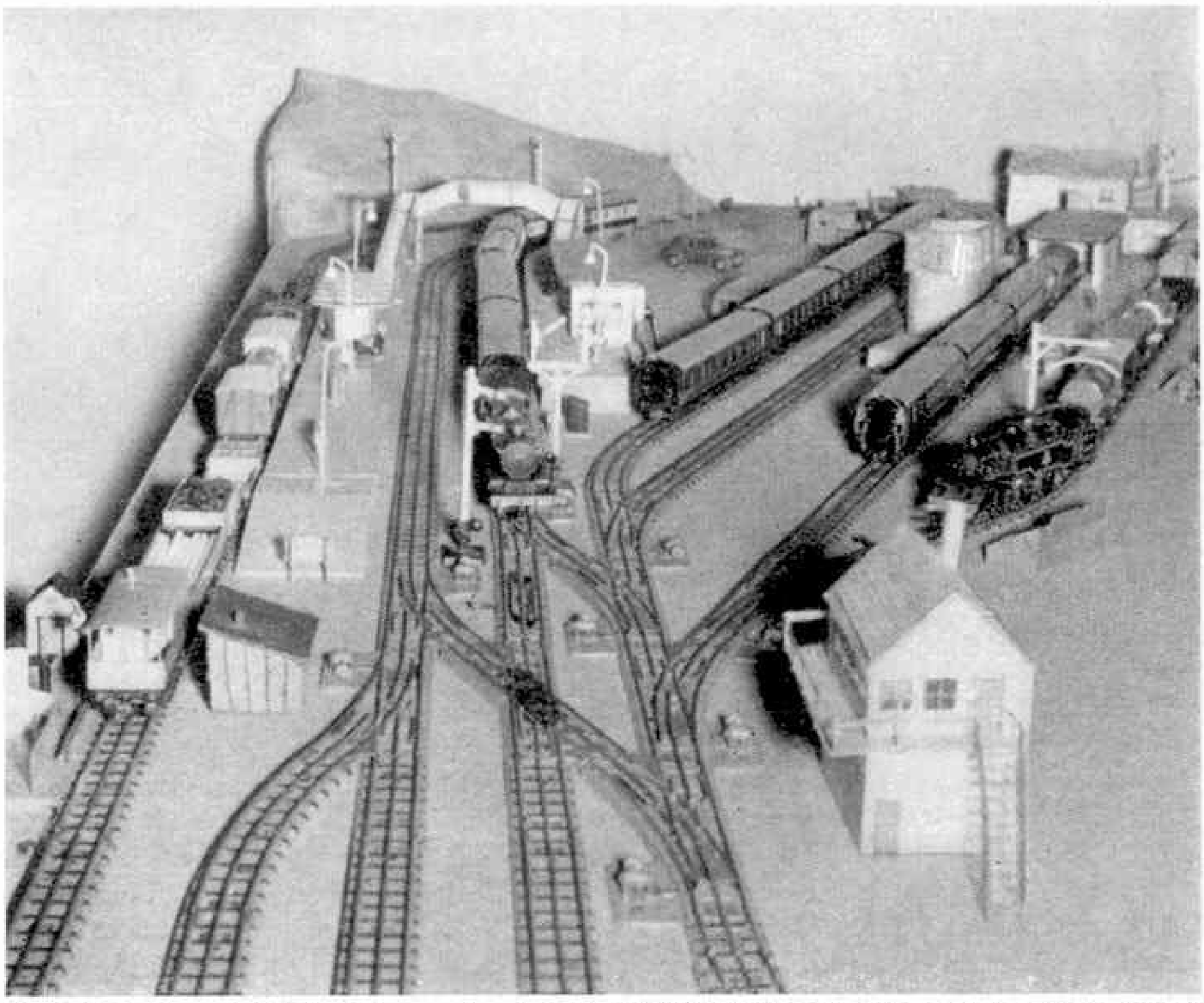


Diagram of the opposite end of the layout pictured above. The section shown incorporates some interesting features.

This is another layout with a double track main line of continuous form following the general

shape of the baseboard. The more involved section is shown in the diagram, the other end of the layout being practically all visible in the upper illustration. This includes the station placed on the inner loop, which develops from the sections shown in the diagram inside the two main lines at each side through an interesting combination of Points and Diamond Crossings. The arrangement will be familiar to most Hornby-Dublo owners.



Part of the layout of John Mason, showing "Bristol Castle" approaching with a train. Points and a crossing are prominent in this picture.

This system is essentially a layout for passenger trains, but goods trains are worked too, and there are plenty of goods wagons to justify the laying down of the sidings and Uncoupling Rails that you see in the diagram. The Turntable and its five radiating tracks are placed conveniently near, not only to the sidings, but also to the station, which represents a place where suburban trains can start, halt or stop. "Running round" is possible and some entertaining operations of this kind are regularly carried out.

In addition to this kind of working there are vehicles for trains of a more long-distance character, and a train of this kind can be seen passing along the outer main line in the picture previously referred to. The main line does not serve the suburban station, but passes behind it.

Up to now not a great deal of scenery has been incorporated on the layout, but the main line passes through tunnels, one at each corner, at the end of the layout where the station is placed.

Control arrangements are of interest and electrical operation of the items like Uncoupling Rails, and of Points except for the three in the sidings, ensures that the operator is able to keep traffic moving in a really satisfactory manner. The independent operation of four trains at once is in fact possible, but only two of them can run continuously. All wiring is taken underneath the baseboard, as is usual, and the owner has very wisely used wires with differently coloured covers for different purposes, so that ready identification is possible. This is a point to which more attention could profitably be given by Hornby-Dublo owners generally.

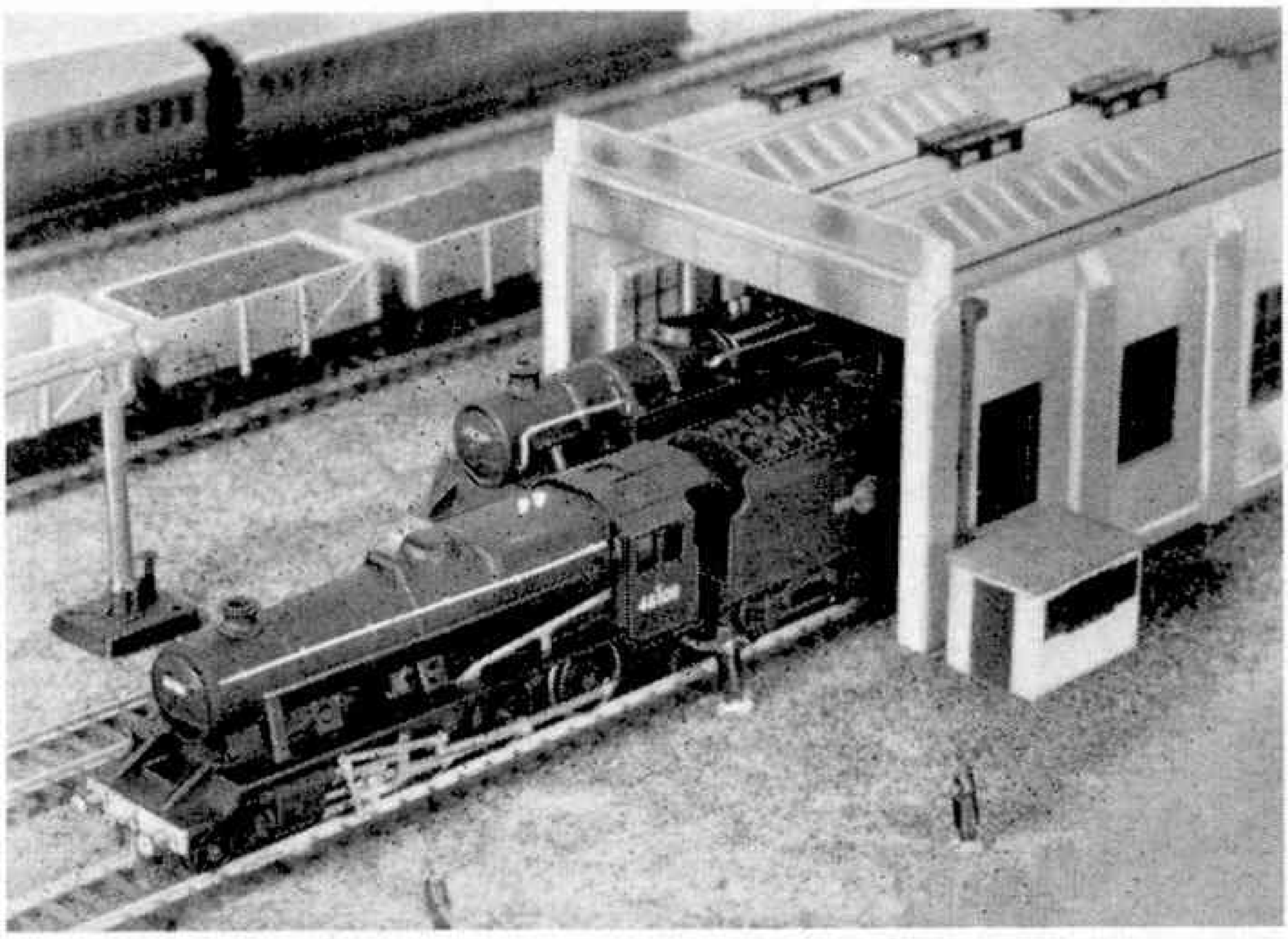
Another instance of the manner in which Hornby-Dublo Points and Diamond Crossings can be used together appears in the illustration on this page, which shows part of the layout of John Mason, Ruislip. Again we have a continuous system, with double track throughout, and with the additional advantage that loop line running also is available through what is known as *Upton Central*. This latter in fact is the station that you see in the illustration. It consists of the Hornby-Dublo Island Platform, with Platform Extensions, serving two tracks, while the third track is served by the Hornby-Dublo Through Station, but without any extension. Platform length had to be curtailed because of the presence of a yard track. In addition to the yard where Coaches are stored, there are other tracks serving the goods depot, in which plenty of traffic is handled by the staff.

The Hornby-Dublo Engine Shed Kit

By "The Engineer"

I KNOW that already many of you have the Hornby-Dublo Engine Shed on your layouts. Those who have not have almost certainly seen the Shed, or illustrations of it as built up from the kit of parts supplied. All of you, I am sure, will be interested to see how real and authentic it looks in actual use in the picture of it that appears on this page.

The introduction of a kit for home construction is a new development in Hornby-Dublo that is being widely welcomed—and one that is to be further extended. The Engine Shed assembled from the standard kit covers two roads, and as it is over 12 inches long it easily provides accommodation for two Pacific Locomotives and their Tenders. Smaller types can of course be got inside with room to spare.



The two-road Engine Shed built up from the Hornby-Dublo Kit really looks the part on this layout. The Platelayers' Hut alongside helps to make everything look just right.

There is little need for me to add to the very clear instructions that are printed inside the lid of the box in which the kit is bought, but there are just one or two things about which several enthusiasts have written to me. For instance, when fitting in the screws that secure the sides to the roof section you may think them too tight a fit in the special sockets in the roof. *They are not.* The point is that the sockets are in effect circular split nuts that are specially made so that they are expanded slightly as the threads of the screws make their way into them.

The result of course is a firm job. Do not attempt to ease the threads at all with any tool, or the whole purpose of these sockets will be upset and you will not have a nice rigid structure. If your Shed is dismantled and built up again on another occasion, you will find the threads a little easier no doubt.

Another point concerns the slots in the "feet" that are formed inside the walls, near each end. These are intended to register with round-headed screws on your baseboard. The screws must be in position first, with their heads clear of the baseboard so that the sides can then be sprung outward slightly to allow the slots to register with the screws, which will then hold the Shed properly in position. It is useless to attempt to place the Shed in position and then drive the screws home, because the roof will get in your way.

Engine Sheds should grow as the railway on which they are used is extended. So the Engine Shed Extension Kit also available allows for expanding the Shed itself to provide four roads. The design is ingenious, and the extension easy. One side of the Shed is removed, and a series of columns or stanchions provided in the Extension Kit put in its place to support the two sections of roof, after which the side taken away is put back in its new position as one side of the widened Shed. A realistic and commodious Motive Power Depot in miniature is the pleasing result.

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For other Stamp Advertisements see also pages 572 and xxvi

Stamp Collectors' Corner

By F. E. Metcalfe



CHRISTMAS STAMPS AND SEALS

This is the time of the year when the envelopes of letters reaching us from certain countries, for example, Denmark, Norway and South Africa, may have fascinating little labels on them. The added pleasure given by the appearance of these labels, or seals as they are more correctly called, comes in part from the good causes behind them. If we get letters from, say, Australia or Cuba, these will be even more interesting, for they will perhaps have on their envelopes real Christmas postage stamps, specially printed for what is to practically all of us the happiest season of the year.

Denmark and South Africa have for some years now indulged in the practice of having Christmas seals. Certain benevolent societies issue sheets of colourful labels for sale on behalf of the charities in which they are interested. People who buy them stick them on their letters, and already many are forming collections of them. This is not a bad idea at all, for they are quite inexpensive, in fact they will generally cost you nothing, and with the many available you can get enough to make quite a show.



Australia is the only country in the Commonwealth that has issued Christmas stamps, and those released this year are the third lot. I will not say that the designs selected have been particularly popular, for Australians are very critical about their stamps, but at least they do not lack interest. The 1957 pair, which was the first issue, depicted a kneeling child, an adaptation of a painting by Sir Joshua Reynolds. Last year's design was considered by many to be more attractive. It featured the Nativity. Their cost is still only a few coppers, either mint or used.

The design selected this year shows the Magi following the star, and nothing could be more apt. I have already remarked that up to the present Australians have criticised their own Christmas stamps rather severely. One critic went so far as to have four stamps specially designed and sent copies to all and sundry. I was one of the sundry, and I must admit that these "show-hows" really were nice.



But to get back to Australia's real Christmas stamps, here are the official sales figures, in which I am sure many collectors, including those of Queen Elizabeth stamps, will be interested: *1957* 3½d., 86,258,000; 4d. 94,333,200; *1958* 3½d., 107,228,040; and 4d., 107,408,040. Incidentally, it is easy to tell the year in which these Australian Christmas stamps are issued, because the date is always incorporated in the design. The sales figures for this year's issue are not known, but I shall be very surprised if they do not go up further. This happened with the New Zealand "Health" stamps, which on their first appearance years ago sold so badly that the 1931 issue, with the famous "Laughing Boy" design, now costs several pounds to buy. Other earlies are quite costly, too.

There is talk that New Zealand will bring out a Christmas issue for 1960. I imagine that we should have had one before now, but for the fact that New Zealand already brings out the "Health" stamps and is doing very nicely with them too. The sales do not even approach those of Australian stamps and are never likely to, for the latter stamps bear no charity premium, and buyers get full postal service for what they pay for the stamps, which is not the case with the New Zealand "Health" issues. After all, this method of collecting funds for charity, however worthy the object may be, has never been very popular. Recently, as collectors know, New Zealand brought out a "Red Cross" stamp bearing a 1d. premium, and the Post Office was heavily criticised for it.

I expect that in time other Commonwealth countries, like Ghana at least, will follow the Australian example and issue "Christmas" stamps. Ghana seems to be issuing more stamps already than all the rest of the Commonwealth, their saving grace being that they are so attractive that we cannot resist them—but is this really a saving grace?

When we come to Christmas seals, we find that most countries go in for them, and it is these that are so plentiful and attractive, and are becoming increasingly popular. Apart from their attractiveness, some of them are very interesting. Take for instance the South African seal issued last year. There was quite a storm when it appeared, so much so indeed that it had to be withdrawn. A used copy of this controversial seal is among those illustrated on this page. Now just have a look at it, and see if you can guess what some people objected to. Later in these notes I'll tell you the answer.

Canada's seals and those of Denmark are much of a muchness, but they are bright and popular. But for really apt designs, when it comes to Christmas postage stamps, those issued by Cuba take the prize. I remember when I first saw a copy of the one

(*Cont. on page 574*)



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For other Stamp Advertisements see also pages 570 and xxvi

Stamp Gossip



A BOTANICAL STAMP

Recently a reader asked me if there were enough stamps to "make places like our Kew Gardens the subject of a collection, and were there any stamps depicting Kew?" Well, there are plenty of stamps depicting various aspects of horticulture. I do not know of any stamps dealing with Kew, but not very long ago Brazil issued a stamp to commemorate the 150th anniversary of the Botanical Gardens in Rio de Janeiro.



Now I am always surprised that a country like Brazil remains content, apparently, to go on producing one crudity after another in the way of special stamps. The "Botanic" stamp illustrated does no justice to one of the world's most impressive public gardens. For instance, it shows about the finest existing avenue of palm trees as a few not very straight lines. I have visited these gardens many times, and they have never ceased to astound me. What a shame that such a poor stamp is connected with such wonders of Nature.

IRISH SLOGANS

Earlier in the year the Irish Post Office announced that in future its special stamps would only remain on sale generally for three months, and for another three months in the Dublin Philatelic Bureau. Already the effect of this decision is being felt, and the stamps of Old Ireland are becoming more popular than ever.

This applies not only to the actual stamps, but also to post marks and slogans, and in connection with the latter a booklet has actually been published that gives a full list of them. The booklet is not the result of the new rule, for it has taken over two years to compile, but it has come at a convenient time. If any *M.M.* readers interested send 2/9d. to Mr. F. E. Dixon, Rossclare Harbour, Co. Wexford, they will get in return a most valuable check list. Irish slogans in general are not scarce, although some are, and a quite nice collection can be got together without a great deal of trouble or cost. I know of one such collection, which fills a whole album, that has not cost its owner a penny!

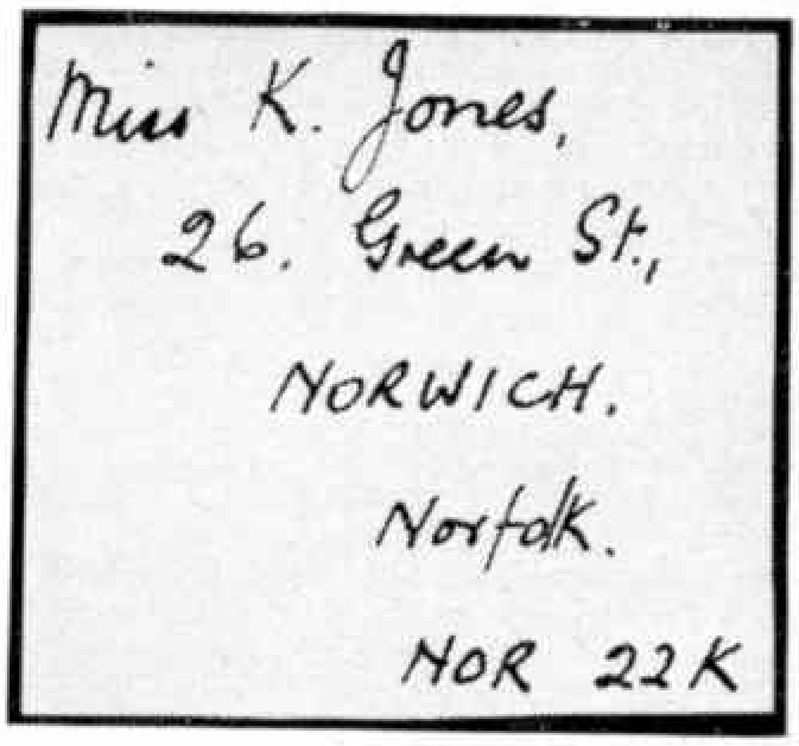
NEW COUNTRIES

I suppose that it is only a question of time before most of the African countries still part of the British Commonwealth and the French Empire will gain their freedom, whatever that may mean. Then no doubt the types of postage stamps issued by them will change as fundamentally as the form of government. But as far as French colonies are concerned, the stamps at any rate will not be improved.

This comment was prompted by seeing a collection of modern French colonial stamps. What a gallery of beauties! Just examine the French Cameroons stamp reproduced on this page, and note the implication of that design. Contrary to what many of our American friends appear to think, colonialism, or imperialism as they like to call it, is not all smash and grab.

OUR UP-TO-DATE POST OFFICE

Some time ago I was invited to attend a meeting in Norwich at which the Postmaster General was to explain the latest method for sorting letters accurately and quickly. Norwich was the first place selected to carry out the plan, but later it is hoped that the whole of Great Britain will be working along the same lines. But of course the public must co-operate if the saving of time and labour is to be effected.



Briefly, and taking Norwich as an example, every householder and all those with business addresses are told the postal codes the P.O. wants them to use. One of our illustrations shows what a correctly addressed letter will look like then. Note the all-important last line.

THE TIP OF THE MONTH

I am going to mention a set this month, not a dear one, that will appeal to young collectors as well as old. It is the current set of Tristan da Cunha. If your pocket doesn't run to a few shillings over a pound, which is what a full set to 10/– would cost, then just buy one up to a shilling, which of course will come a lot cheaper.

The reason for this is that no more of the present set will be printed, as a new one is to appear, if possible in January.

So there you have my little December tip and, may I add, my best Christmas wishes with it.



Bangs for Bon-Bons—(*Continued from page 529*)

by twisting string very tightly round it. Into the other end the hand-worker drops the paper hat, toy or trinket, and this end is then "choked" also. The cracker is finally completed when the decorative "scrap" or other embellishment has been added to the outside.

In the cheaper Christmas crackers, certain machines do the job of cutting the fancy fringe, and others spread out the layers of foundation paper in strips measuring over two feet in length. Hand guillotines are employed to cut the strips into various lengths required for the diverse types of crackers.

During the century of its existence, the Christmas cracker has taken on many bizarre forms, and has contained all sorts of unusual things. Once it was made like a banana, while other crackers were created in the shape of slices of cake, twelve of which were fitted together to make a complete cake. Again, when I was a child, one could buy crackers that contained indoor fireworks.

The most gigantic, and undoubtedly the most extraordinary Christmas cracker of all time, was a unique one constructed for a wealthy nobleman living in Northern England. It cost no less than £500, and was placed beneath the dome in the baronet's ballroom at his country mansion. It was electrically illuminated with all the colours of the rainbow, and was filled to the brim with expensive presents and toys for every child living on the estate and in the neighbouring villages and hamlets. These gifts were distributed after the children had climbed to the summit of a miniature spiral staircase inside the cracker.

After the last child had received its present, a cord was pulled and a small detonator within the Christmas cracker exploded, much to the boisterous enjoyment of every boy and girl present. A newspaper correspondent who reported the party, wrote: "It was an amazing sight, for at the moment of detonation the whole structure was enveloped in coloured electric fires."

At Sea in the H.M.S. "Victorious"—(*Cont. from page 532*)

airman could be picked up and brought to safety in the carrier. And a Sea Vixen from the Naval Air Station at Yeovilton paid the ship a brief visit so that we could see this superb new two-seat all-weather fighter which will soon replace the Sea Venom.

There was plenty of interest below decks too; for the modern seaman has far better comfort and food than his predecessors, to offset the increased tempo and noise on deck. Instead of an old-style hammock, he has a bunk in which to sleep. In the self-service dining hall he has the choice of several really tasty dishes at each meal. Nor does he have to wash his own clothes any longer, for a fully-mechanised laundry delivers them in bundles, pressed and folded.

All this is important, for a happy ship is an efficient ship, and everything about the *Victorious* indicates that she is both happy and efficient. Within a few months she will be even better, for Sea Vixens will take over from her Sea Venoms, Skyraiders will give way to the new A.E.W. Mk. 3 version of the Gannet, and she will embark her anti-submarine helicopter squadron. Then, more than ever, the *Victorious* will live up to the Admiralty's description of her as "the most up-to-date atomic age fighting unit afloat".

Road and Track—(*Continued from page 541*)

steering, free from road shocks, is superb and the 848 c.c. engine, allied with modest overall weight, gives sparkling performance equal to the Minor 1000. The Mini-Morris is definitely head and shoulders above those cars in the "buzz box" class.

The gear-box begs to be used, although it is too easy to miss third gear when changing up from second and being left to grope around the box before engaging. I found that 40 in second and 55 in third enabled me to use the extreme handiness of the Mini-Morris to full advantage. The happy cruising speed was 65, whilst 75 was easily reached and held on many occasions.

Undoubtedly B.M.C. have produced a "Car of the Century" and the designer, Mr. Alec Issigonis, may well compliment himself on a car for the masses that is far too lively ever to clutter up the roads because of lack of power. These B.M.C. babies are years ahead of their time and a devastating reply—at long last—to Continental manufacturers of baby cars.

About a Number of Things—(*Continued from page 557*)

In the making of this, stainless steel plays a great part, for it is ideal for use in making equipment that produces the gorgeous cream product that nowadays is almost as much enjoyed in winter as in summer.

And the wonderful improvements in the quality of this "treat", for after all it does remain one, has led to the invention of countless different ways of dealing with it, of eating it, in fact. The beginning of this process appears to have come with a wonderful thought by our old friend Ybsur, who seems to have been very good at finding easy ways of doing things. In one of his books he writes as follows:

It is not just a question of making the stuff. You have to eat it and some people say there's more art in that than in anything else connected with ice cream. Take a wafer on a hot summer's day. You're happy for the first minute or so. Then the melting starts. A lick at one side and three white streaks down your waistcoat from the other. A smart turn round to arrest the drip, but you can't lick all sides at once. It's a losing battle. A veritable cataract. With a little ingenuity, I personally have overcome this problem. I eat cornets.

Yes, Ybsur had many smart ideas, and all we have to do to bring this one up to date is to remember that ice-cream melts very quickly in a warm room too, and to recall that waistcoats are getting scarcer in these days of two-piece suits and what have you. Schoolboys now wear pullovers under their blazers anyway.

Hornby Railway Company—(*Continued from page 565*)

double chimney Pacific bears the name *Golden Fleece*, that of a well-known member of the real class. As with the corresponding Three-Rail *Flying Scotsman* Set, engine and coaches are provided with correct name boards and destination labels. This applies as well to *The Caledonian*. The engine headboard of this train on real railways is of striking design, and its shape and attractive colouring are reproduced very accurately in the Hornby-Dublo representation, so that those who run it in miniature with its Hornby-Dublo representation will provide their parents and friends with a wonderfully effective railway scene.

Don't forget that these new train name labels are available separately, and owners who are already using the original range of titles should lose no time in extending their range by adding these new ones.

Stamp Collectors' Corner—(*Continued from page 571*)

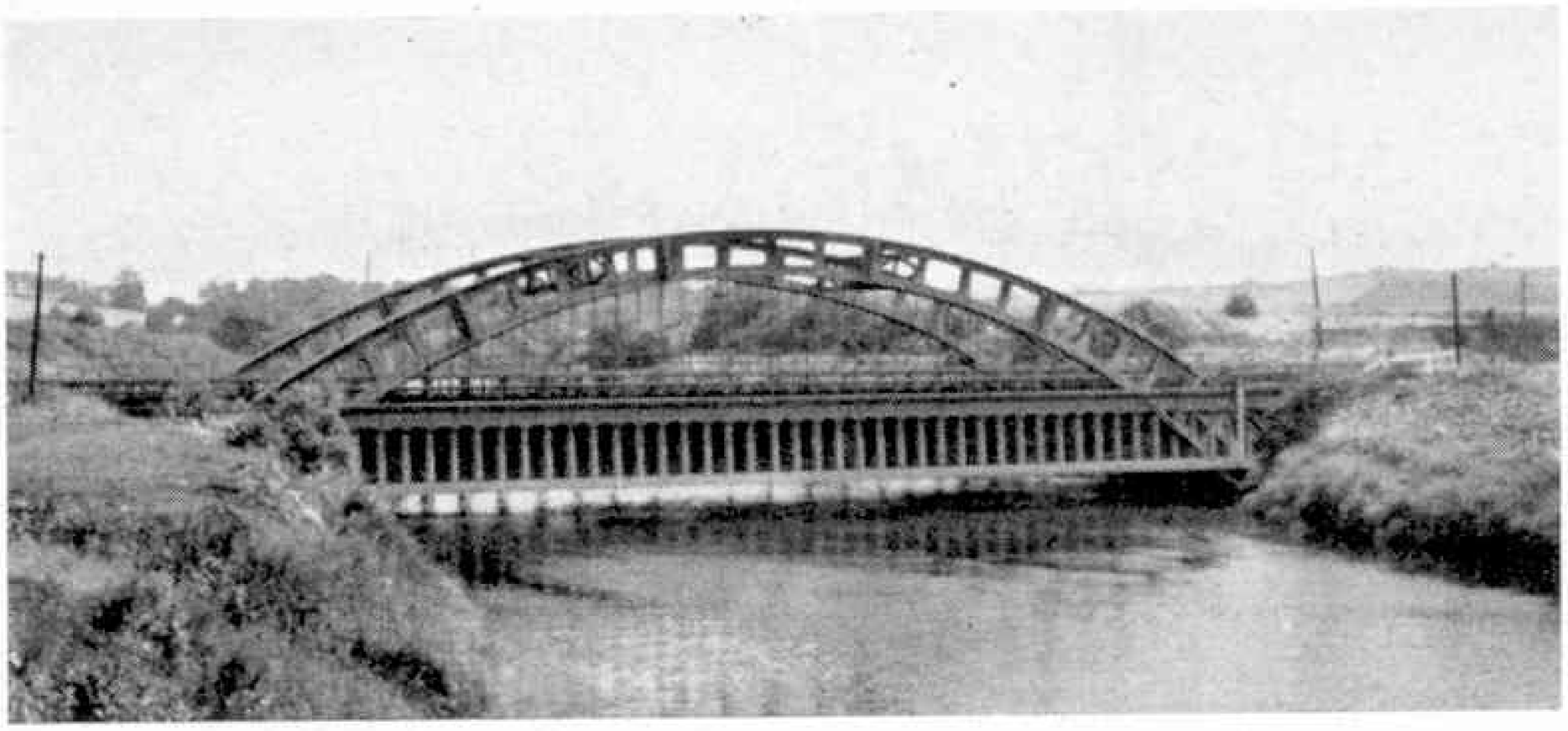
illustrated, depicting a real Father Christmas, for a moment I thought that it was just a seal. The word *Navidad* on it of course means Christmas. Since then Cuba has issued another winner. A fine cock turkey is the motif.

And so it goes on each year, new seals appearing all the time, most of which can be picked up for nothing. No wonder they are popular. And now, did you guess what the cause of the trouble over the South African seal was? Well, the halo around the head of Christ's mother is larger than that around the head of the infant Jesus himself. That was felt by some people to be not right, so to stop all complaints the seal was withdrawn.

I hope that I have written enough to interest others in what is a fast growing cult. I must say that I have a weakness for the things myself, and just about the time these lines are appearing in print, I shall be watching all the letters that come in. I won't be the only one, for I am sure that some of my readers will be doing the same thing. So good Christmas hunting. Perhaps next year we will again compare notes on these seasonal offerings.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.



Stanley Ferry Aqueduct, which crosses the River Calder between Castleford and Wakefield. Photograph by J. R. Milner Leeds.

A Yorkshire Aqueduct

Stanley Ferry Aqueduct carries the Castleford–Wakefield branch of the former Aire and Calder Navigation Company's canal over the river Calder a few miles to the north of Wakefield. It was built to avoid the numerous bends of the Calder between these towns.

The aqueduct, which was designed by George Leather of Leeds, and constructed by Messrs. Grahams of the Milton Iron Works, near Sheffield, consists essentially of a cast-iron tank suspended by steel rods from two bow-string girders, also of cast-iron. The tank, which is built up of flanged plates 6 ft. by 3 ft. by 1 in. thick, is 180 ft. long, 24 ft. wide and 9 ft. deep, holding at the normal water depth of 8 ft. 6 in. 940 tons of water. The bow-string girders span 155 ft. and each weighs 101 tons.

Three years were spent in the construction of this aqueduct, which was opened in August 1839 by the passage of the *James*, a splendid schooner, according to a contemporary report, of 160 tons then recently built at Wakefield.

Today's traffic over the bridge consists principally of coal and liquids in bulk, but also includes considerable quantities of grain and general merchandise, carried by vessels of British Transport Waterways North Eastern Division.

J. R. Milner (Leeds 15)

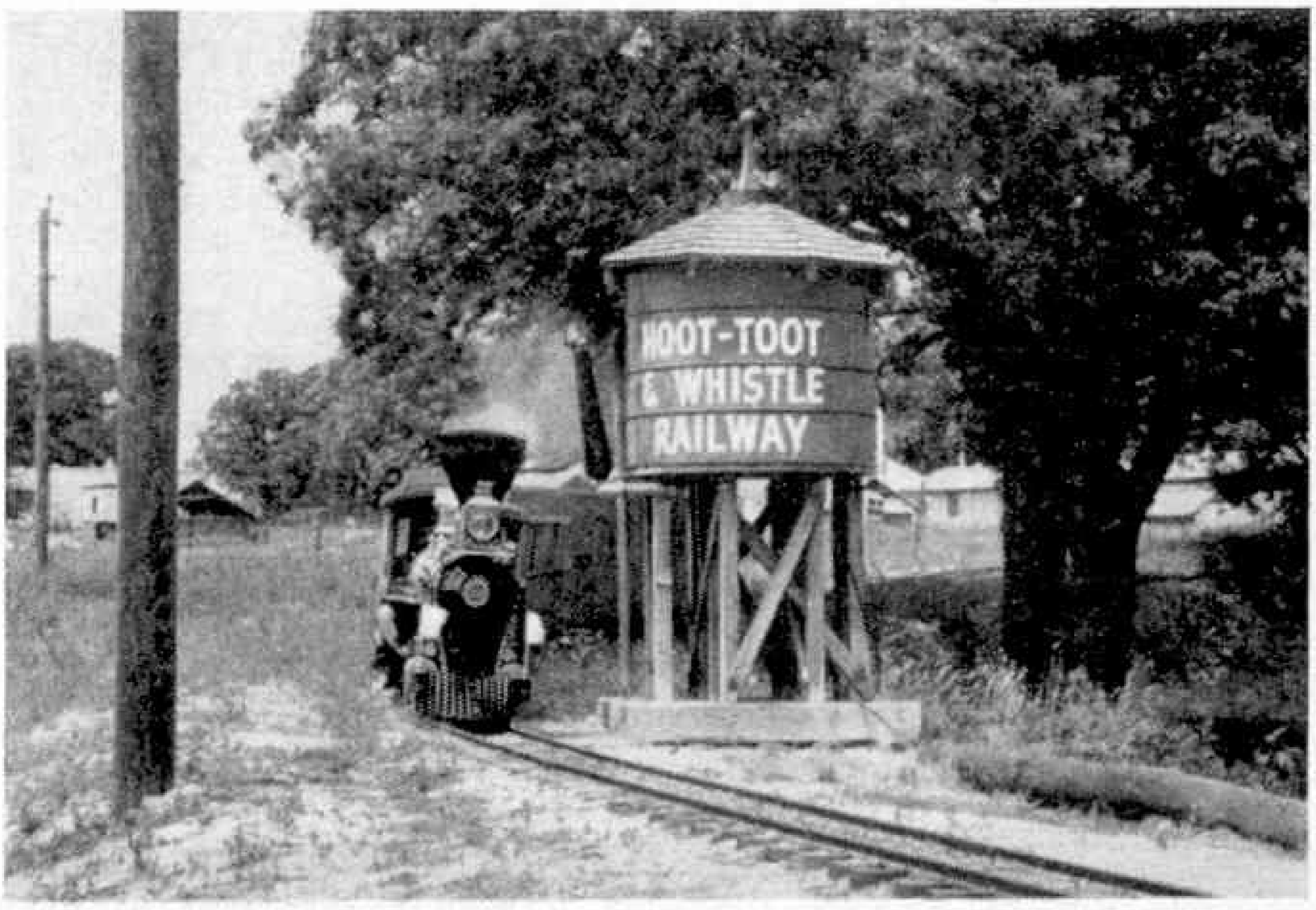
Hoot-Toot and Whistle!

Here is a line that rejoices in the picturesque name on the water tank seen in the lower picture on this page. It is a 15 in. gauge railway on a private estate near Elgin, U.S.A., which is open to visitors at week-ends.

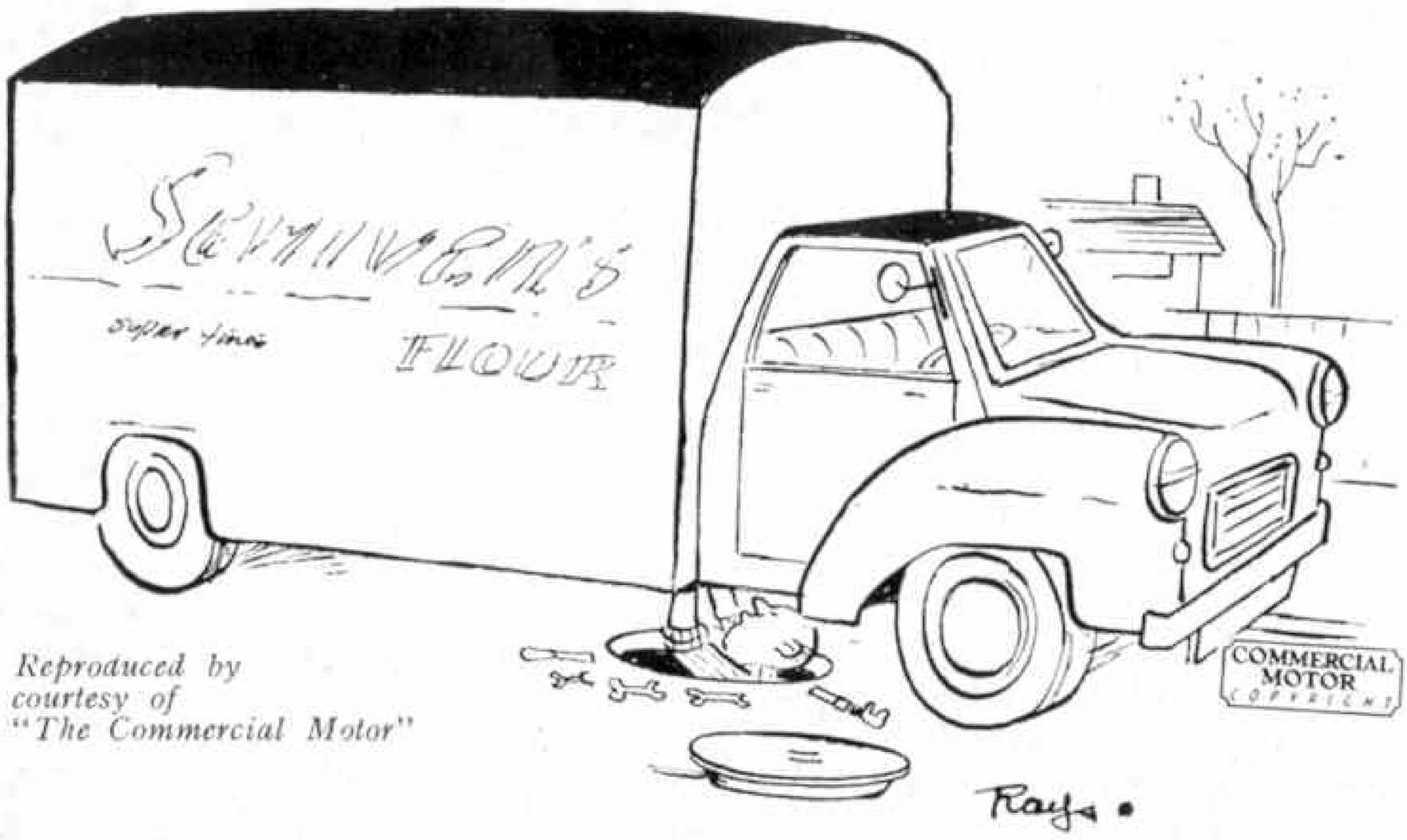
The locomotive is a replica of the famous 4–4–0 woodburner "General" of American Civil War days, and is steam-powered, but a petrol tractor is used for maintenance and repair work on the track. The coaches are replicas of those in use during the Civil War period, but the end doors are dummies, and side doors are fitted for the use of passengers.

There is a real railway in the United States, the Hoosac Tunnel and Wilmington R.R., that is often spoken of as the "Hoot-Toot and Whistle" line.

H. E. Meats (Birmingham)



"General" runs on the Hoot-Toot and Whistle Railway. Photograph by C. E. Keevil, Chicago.



Reproduced by courtesy of "The Commercial Motor"

Fireside Fun

"Good day, ma'am," said the stranger when a woman answered the doorbell of a boarding house, "would you like to buy some insect powder?"

"No", she told him flatly, "I have no use for it."

"Good", replied the stranger. "I'll take that room you're advertising 'to let'."

* * * *

Boss: "I hope you thoroughly understand the importance of punctuation."

Newly-hired Secretary: "Why, yes sir! I always get to work on time."

* * * *

The judge read the list of charges, looked sternly at the accused, and asked "Is it true that you robbed the same house twice in less than a week?"

The burglar nodded sadly. "Yes, sir. Ain't this housing shortage terrible?"

* * * *

A letter received by a syrup manufacturer read:

"Dear Sir: Please send me my money back. After taking six tins of your corn syrup, my feet aren't any better than they were before."

* * * *

"What is a debtor, pa?"
"A man who owes money."
"And what is a creditor?"
"The man who thinks he is going to get it."

* * * *

"Hard work pushing your invalid husband around in a wheel-chair all day," said the sympathiser in the crowd entering a big theatre. "Here's sixpence."

"Thank you, Sir. It *would* be hard work if we didn't take it in turns. He rides in the morning and I ride in the afternoon."

* * * *

A Producer was making a prison film, and he did some of the shots at an actual prison. In one scene the convicts were supposed to line up for a game of football.

"Wait a minute, wait a minute!" the Producer protested. "You have twelve men on a side!"

"Yes," one of the prisoners grinned. "That's why we're here. We cheat!"

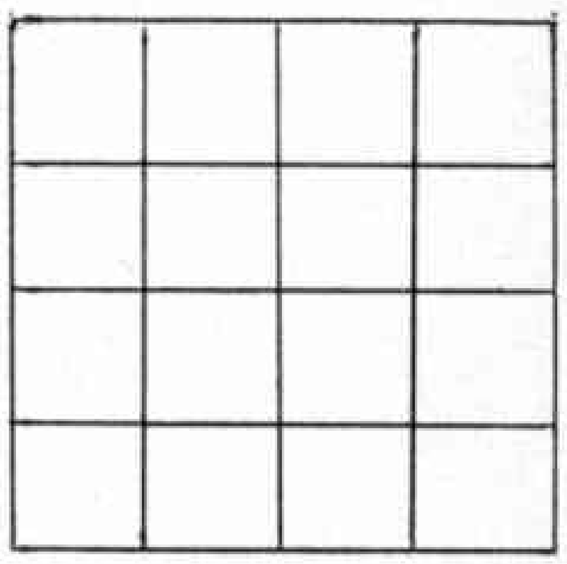
And lastly there is the story of the absent-minded Professor who wrote the address, put the envelope in his coat pocket and dropped the pen in the post box.

* * * *

BRAIN TEASERS

A NUMBER PUZZLE

Fill in the squares shown alongside by putting consecutive numbers in adjacent squares. For example, the number 2 may be placed in a square either above, below or at the side of that containing the number 1, but the numbers in each vertical column must add up to the same total.



INDIAN WISDOM

A Red Indian Chief lay dying. He had two sons, both of whom he loved dearly. As he could not decide which one should succeed him as chief, he set them a problem. He said they were to race to a distant village on horseback, and the one whose horse arrived LAST would be Chief. On asking the wise man of the village how they should solve their problem, he spoke two words into their ears, and away they galloped. Can you guess which those two words were?

ANSWERS TO LAST MONTH'S PUZZLES

Missing Words

Mary sat with *slate* in hand
Writing *tales* dramatic.
Did she *steal* the plots she planned?
Negative emphatic!
Stale to us the *tales* may be
But at *least* they're new to she.

Quickie Crossword

The solution to the crossword given in the November "Fireside Fun" page is illustrated above.

D	I	A	G	R	A	M
I	▨	▨	L	▨	▨	O
M	O	N	A	R	C	H
▨	▨	U	S	A	▨	▨
S	U	N	S	P	O	T
I	▨	▨	E	▨	▨	O
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THE STORY OF THE WHEEL
No. 3



putting a spoke in the wheel

FROM the early wooden wheels of 3000 BC, which as you can imagine, were somewhat rough and cumbersome in motion, man progressed to the spoked wheel. This was used by the early Greeks and Egyptians, apparently to achieve greater lightness—and therefore greater speed—for their war chariots. Leather, iron and even bronze tyres for the outside of the rim were also known to have been in existence from about 2000 BC, but progress was slow. Britain did not, in fact, see the wheel until about 500 BC but the early designs showed little improvement until the arrival of the Dunlop pneumatic tyre in 1888—over 2,000 years later. This then set in motion the rapid developments that followed and eventually helped to produce the comfort, speed and safety to which we are now accustomed.

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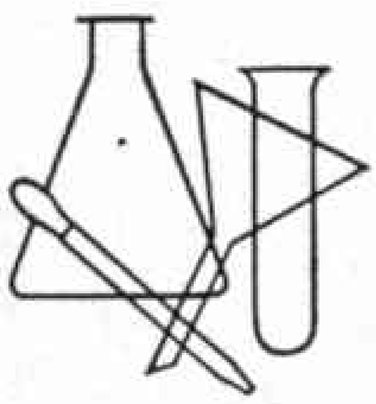
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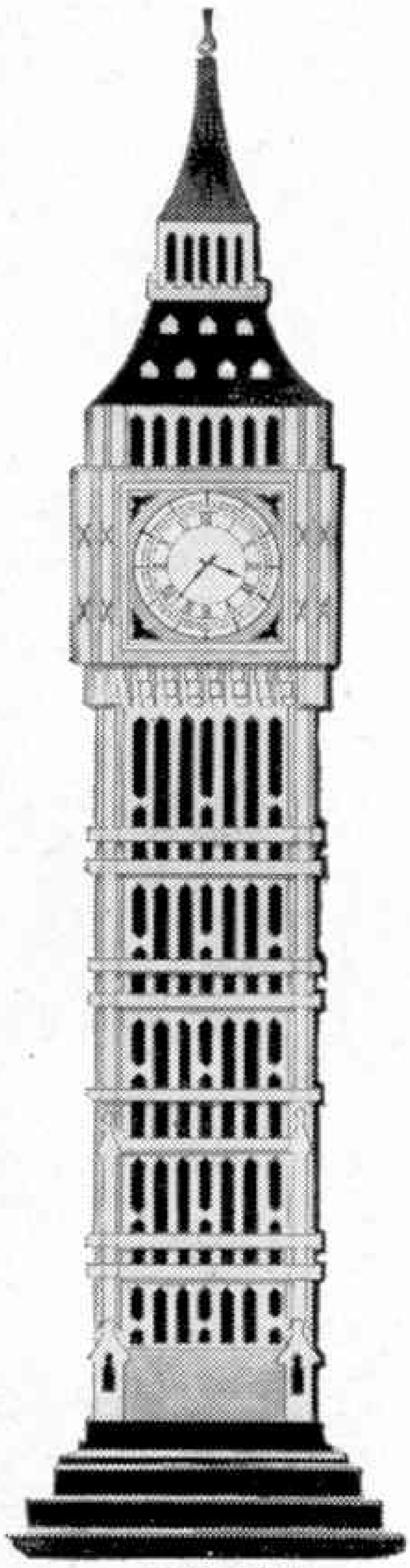
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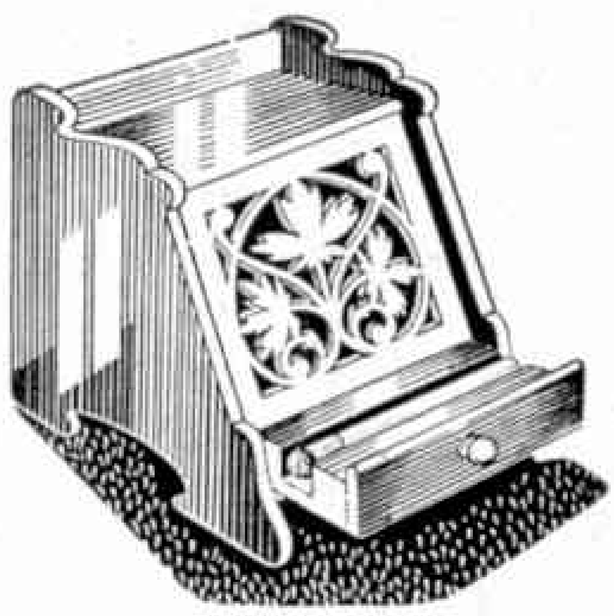
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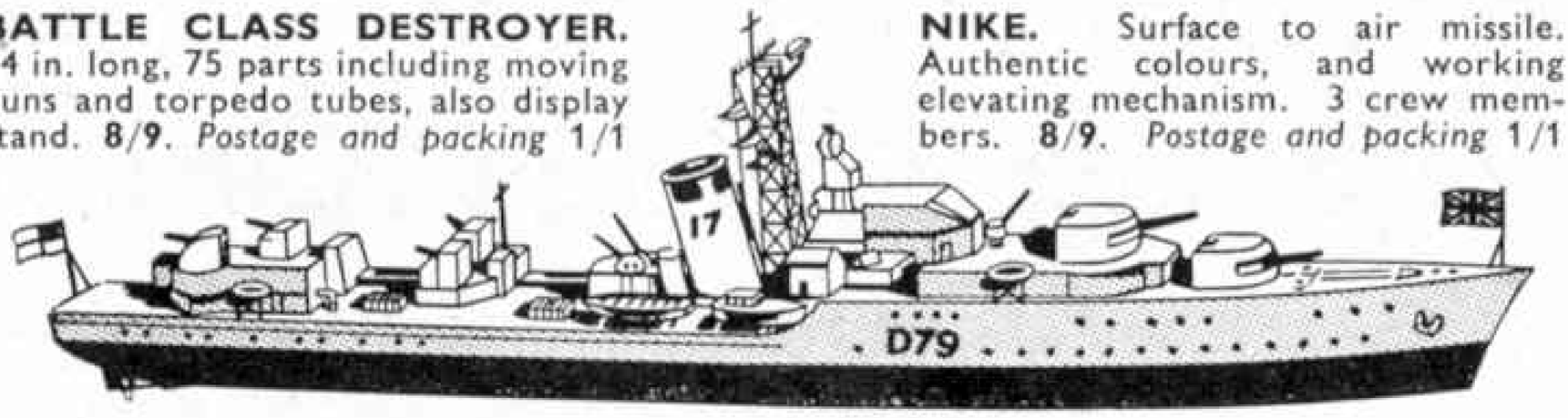
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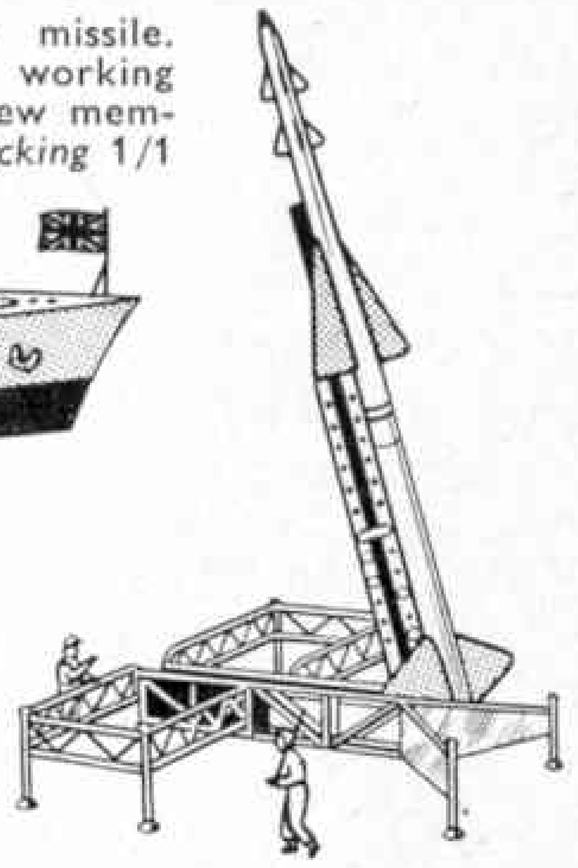
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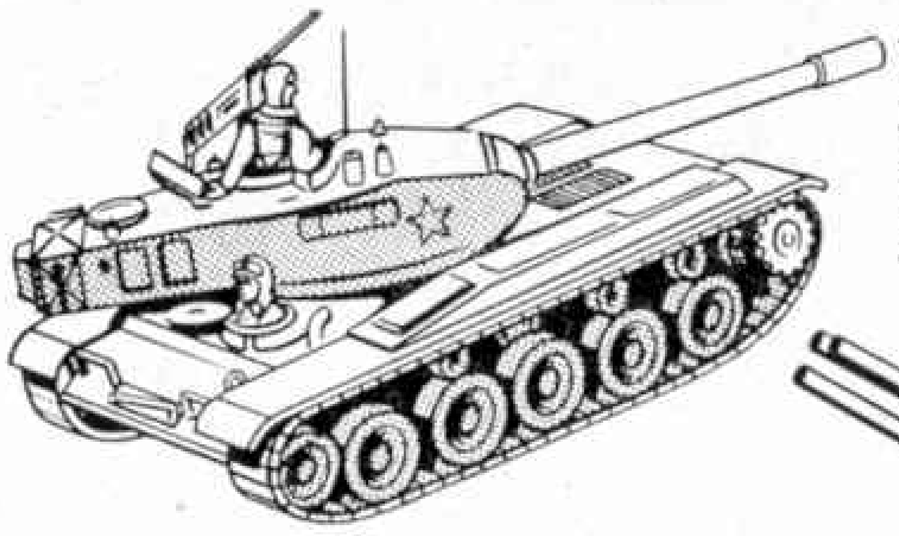
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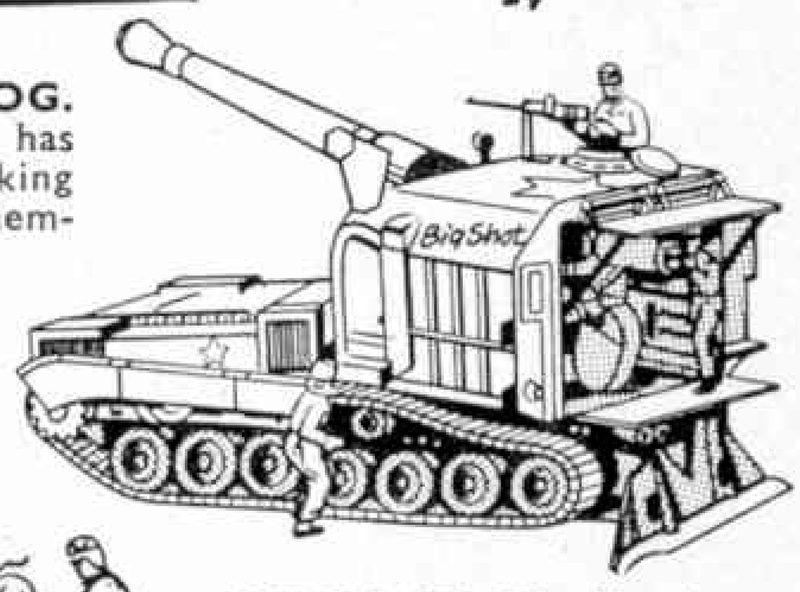
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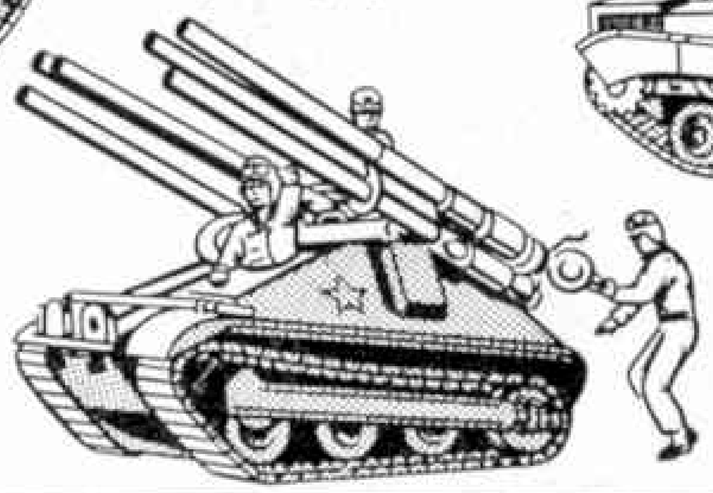
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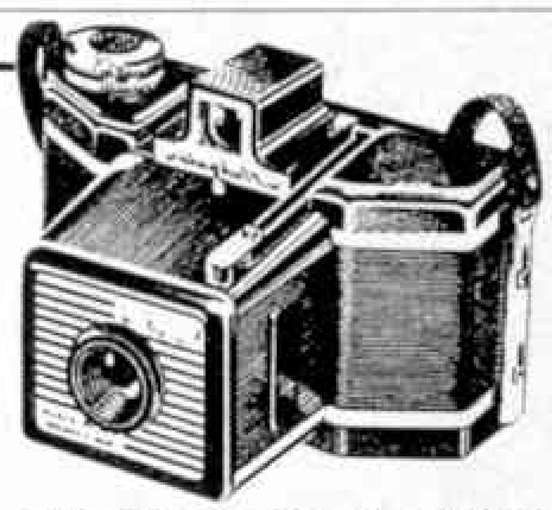
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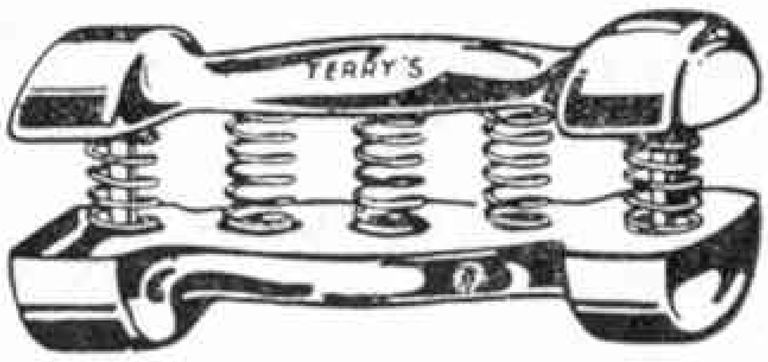
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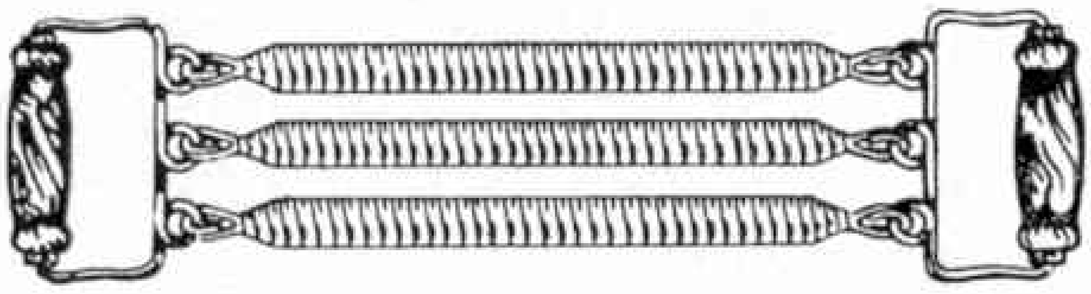


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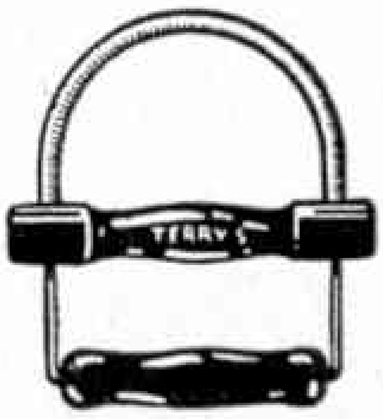
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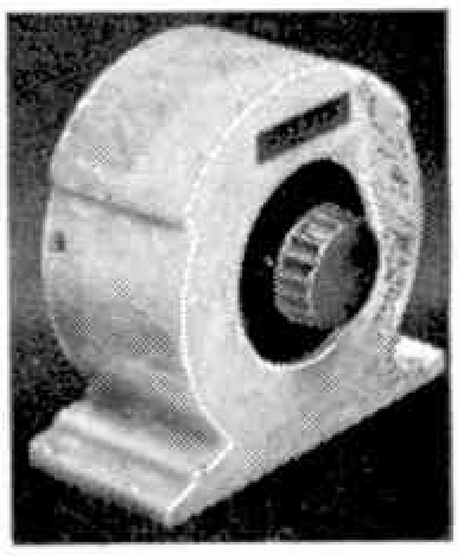
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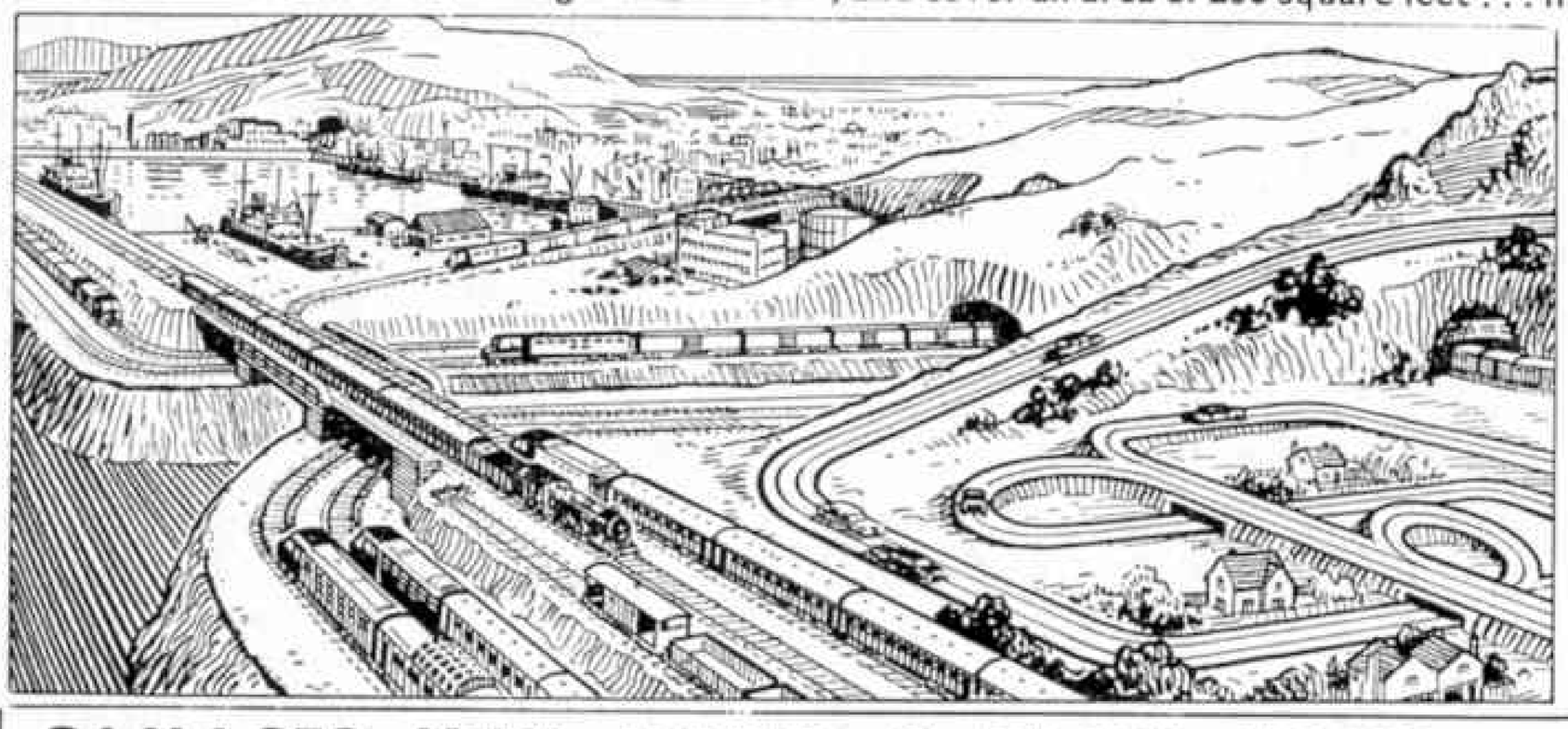
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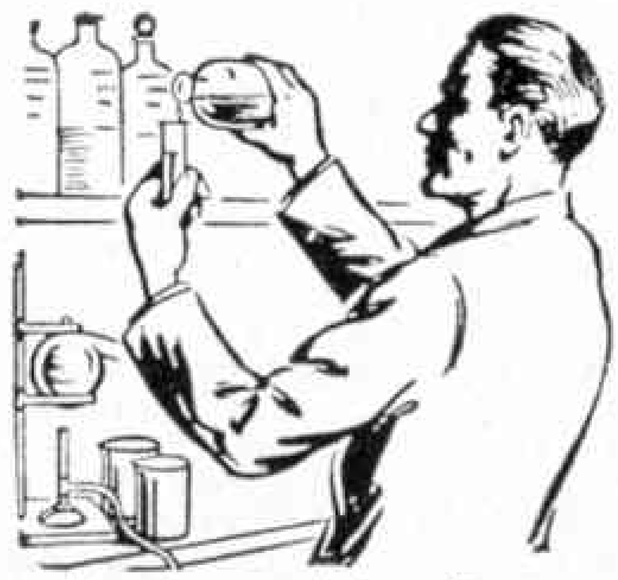
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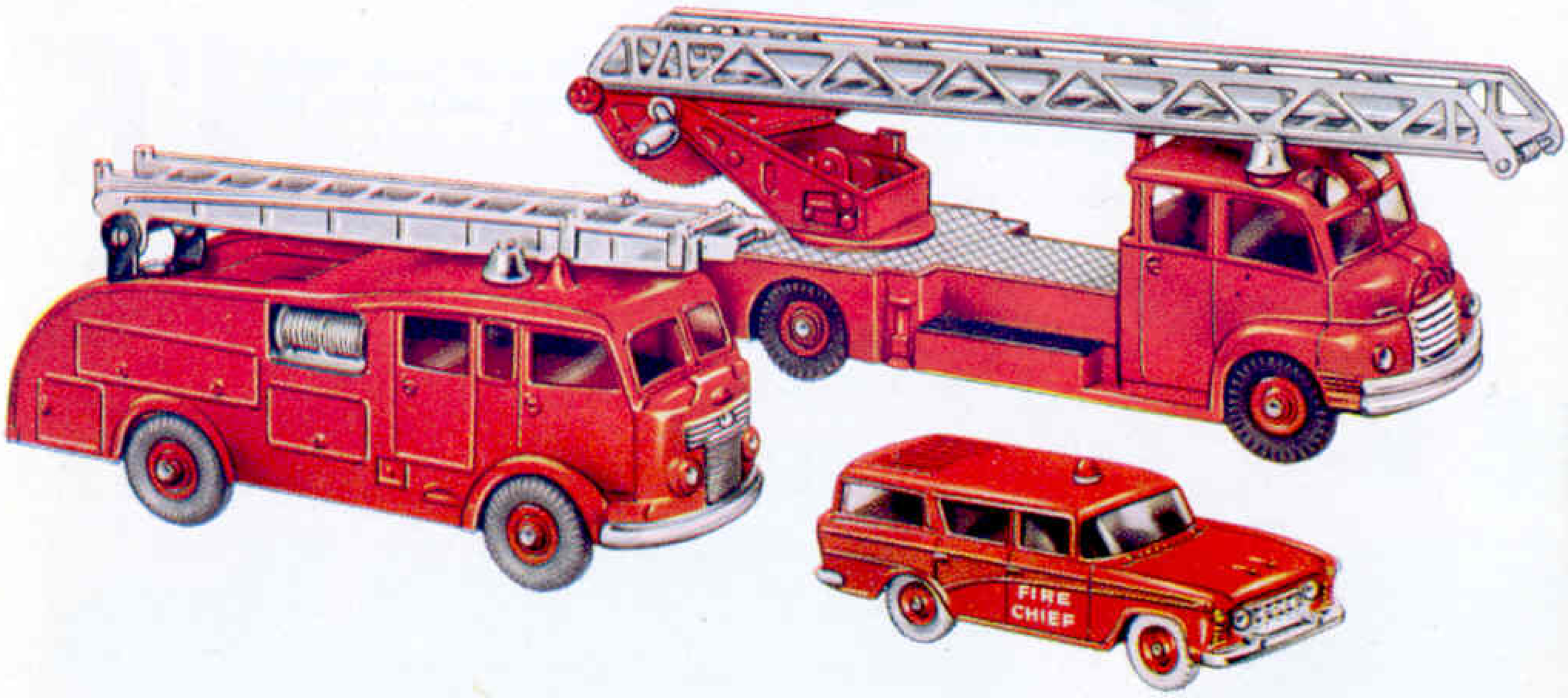
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Meccano Weight-Driven Clock Mechanism.

Illustrated in the December, 1959, Meccano Magazine.

The housing for the mechanism is made by bolting two 12½"Angle Girders at each side to a 5½" x 2½" Flanged Plate 1 and to a 5½" x 2½" Flat Plate 2. The sides are connected at the rear by a 4½" x 2½" Flat Plate 3, and by three 4½" Strips at each of the points indicated at 4, 5 and 6 (Fig. 1). A 5½" Angle Girder 7 is held inside each Flanged Plate by the same bolts that fix the 12½" Angle Girder in position, and Girders 7 are connected by two 4½" x 2½" Flat Plates 8. Two 4½" Strips 9, placed face to face are bolted in place as shown in Fig. 1. A 2½" Triangular Plate is fixed to the Flat Plate 3 and the upper Flat Plate 8, and the Triangular Plates are extended upward by 1½" Strips 10.

A double winding barrel for the Cords supporting the weights is assembled from three Wheel Flanges and three Face Plates. Two of the Wheel Flanges are placed between two Face Plates to make the drum for one of the Cords, and the second drum consists of a single Face Plate and Wheel Flange. The parts forming the drums are clamped tightly together by four 1⅛" Bolts, and the drums are fixed by the set screws in the Face Plates to a 4" Rod. A Ratchet Wheel 11 is fixed on the Rod, and a 3" Sprocket 12 is free to rotate between the Ratchet and the Strips 6. The Sprocket is fitted with a Pawl 13, freely mounted on a ¾" Bolt fixed by two nuts in the Sprocket. The Pawl is held against the teeth of the Ratchet by a 2½" Driving Band, which is passed through the hole in the Pawl and is looped over a ½" Bolt fixed by two nuts in the Sprocket. The bearings for the 4" Rod are reinforced by Double Arm Cranks bolted to Strips 6 and 9.

The Sprocket 12 is connected by Chain to a 1" Sprocket on a 2½" Rod 14, and a 1½" Sprocket on Rod 14 drives a 1" Sprocket on a 2½" Rod 15. Rod 15 is fitted with a 57-tooth Gear 16, and a ½" Pinion that drives a 57-tooth Gear on a 4" Rod 17. The Gear is loose on Rod 17, but it is pressed by a Collar against a 1" Pulley fitted with a Rubber Ring. This arrangement forms a friction drive that enables the clock hands to be adjusted.

A ¾" Pinion is fixed on Rod 17 behind the 1" Sprocket seen on Rod 15 in Fig. 1. This Pinion is in mesh with a 50-tooth Gear on a 2½" Rod 18 (Fig. 3) that

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carries also a 1" Gear, and the 1" Gear engages a similar Gear 19 on a $2\frac{1}{2}$" Rod 20. Rod 20 is fitted with a $\frac{3}{4}$" Pinion that drives a 50-tooth Gear 21 on a $2\frac{1}{2}$" Rod. A $\frac{1}{2}$" Pinion 22 (Fig. 3) is fixed on the $2\frac{1}{2}$" Rod outside the Flat Plates 8, and this engages a 57-tooth Gear that is loose on Rod 17. The 57-tooth Gear is spaced from the Flat Plate 8 by a Collar, and the hour hand is bolted to a Double Bracket fixed to the Gear. The hour hand consists of two $2\frac{1}{2}$" Curved Strips bolted to the Double Bracket, and a Fishplate held by the same bolt is slipped over Rod 17. The minute hand is assembled as shown in Fig. 3, and it is bolted to a Crank fixed on the end of Rod 17.

The drive to the escapement wheel is taken from the 57-tooth Gear 16 to a $\frac{1}{2}$" Pinion on a $2\frac{1}{2}$" Rod 23. A 1" Gear is fixed on Rod 23 outside the Flat Plates 8, and it drives a similar Gear on a $2\frac{1}{2}$" Rod 24. Rod 24 is fitted with a 50-tooth Gear that engages a $\frac{3}{4}$" Pinion on a $2\frac{1}{2}$" Rod 25, and a 57-tooth Gear on Rod 25 drives a $\frac{1}{2}$" Pinion on the escapement shaft 26. This shaft is a 3" Rod, and the escapement wheel a 3" Sprocket, is fixed outside the Flat Plate 3. Collars are used to hold the gear train Rods in position.

The pallet is a $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip 27 bent to the shape shown in Fig. 4. It is attached by a bolt to a Collar on a $3\frac{1}{2}$" Rod 28, mounted in the Triangular Plates and the lower holes of Strips 10. Three Washers are placed on the bolt before it is passed through the Double Angle Strip. Rod 28 is fitted at its outer end with a Coupling, and a 4" Rod held in this Coupling carries a Coupling 29. Two 1" Rods are fixed in Coupling 29 to form the crutch for the pendulum.

The pendulum consists of an $11\frac{1}{2}$" and an 8" Rod connected by a Coupling and extended by a 6" Screwed Rod held in a Threaded Coupling. The bob weight is made by bolting a Boiler End to a Face Plate by means of two $\frac{3}{4}$" Bolts. The Screwed Rod is passed through opposite holes in the Boiler End, and nuts are used to keep the weight in position.

An End Bearing 30 is fixed to the upper end of the pendulum and two short lengths of spring wire are clamped in it by a nut and bolt. The lengths of wire are fixed also in a second End Bearing that is held on a $3\frac{1}{2}$" Rod 31. The Rod is passed through the top holes on Strips 10 and retained in place by Collars. Two Collars 32 are fixed to the pendulum, one on either side of the 1" Rods in Coupling 29.

Lengths of Cord are tied to the drums of the winding barrel, and are wound round the drums anticlockwise. One length is passed over a 1" Pulley on a 2½" Rod 33, and the free ends of both lengths of Cord are fitted with small Loaded Hooks. The clock weights are Boilers complete with Ends filled with lead scrap and they are attached to the Loaded Hooks.

The Clock is wound by a Bush Wheel fixed on the end of the Rod that carries the winding drums and a key can be made by bolting two 2½" Angle Girders to a second Bush Wheel. The Angle Girders are first joined together by ¾" Bolts passed through elongated holes, and the shanks of these Bolts are then slipped through holes in the Bush Wheel and are held in place by nuts. The boss of the Bush Wheel fits in the channel formed by the Flanges of the Angle Girders, and the projecting ends of the ¾" Bolts can be inserted in holes in the Bush Wheel on the end of the winding shaft.

The Clock requires careful adjustment, but once the correct setting has been obtained it will keep good time. The Double Angle Strip 27 should be bent so that when it is horizontal and the pendulum is vertical, the lugs of the Double Angle Strip just clear the teeth of the Sprocket. When the pendulum is in motion the escapement wheel is allowed to move the space of one tooth for each swing.

The position of the Collars 32 must be adjusted so that they leave just sufficient play for the pendulum to swing freely. The clock is regulated by altering the position of the bob weight on the Screwed Rod. If the clock gains in time the position of the bob should be lowered, while if it loses time a higher position on the Screwed Rod is wanted.

Parts required to build the Clock Mechanism:- 10 of No. 2a; 2 of No. 6a; 4 of No. 8; 2 of No. 9; 1 of No. 10; 1 of No. 11; 1 of No. 13; 1 of No. 13a; 3 of No. 15b; 2 of No. 16; 9 of No. 16a; 1 of No. 16b; 2 of No. 18b; 2 of No. 22; 1 of No. 24; 3 of No. 25; 4 of No. 26; 3 of No. 27; 4 of No. 27a; 4 of No. 31; 41 of No. 37; 21 of No. 37a; 40 of No. 38; 1 of No. 40; 1 of No. 48a; 2 of No. 52; 3 of No. 53a; 2 of No. 57c; 17 of No. 59; 1 of No. 62; 2 of No. 62b; 3 of No. 63; 1 of No. 63c; 2 of No. 70; 2 of No. 76; 1 of No. 79a; 2 of No. 89b; 2 of No. 90; 1 of No. 94; 1 of No. 95a; 2 of No. 95b; 2 of No. 96; 4 of No. 109; 3 of No. 111; 1 of No. 111a; 7 of No. 111c; 4 of No. 111d; 2 of No. 126a; 3 of No. 137; 1 of No. 147a; 1 of No. 148; 1 of No. 155; 2 of No. 162; 1 of No. 162a; 2 of No. 166; 1 of No. 186.